IONOSPHERIC DATA

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TERMINOLOGY AND SCALING PRACTICES

The symbols and terminology used in this report are those adopted by the International Radio Propagation Conference, and given in detail on pages 24 to 26 of the report IRPL-C61, "Report of International Radio Propagation Conference," and in the section on "Terminology" in report IRPL-F5.

Beginning with IRPL-F14 the symbol L, defined as follows, is used in detailed tabulations of hourly values of ionosphere characteristics observed at Washington:

> L or l = critical frequency, muf, or muf factor for F1 layer omitted because no definite and abrupt change in slope of the h'f curve occurs either for the first reflection or for any of the multiples.

In the past, ionospheric conditions were summarized on a monthly basis by using average or mean values for each hour of the day for each month. However, following the recommendations of the International Radio Propagation Conference, held in Washington April 17 to May 5, 1944, beginning with data for January 1, 1945, median values are published wherever possible.

Where averages are reported, they are, at any hour, the average for all the days during the month for which numerical data exist.

The monthly median values used here are the values equaled or exceeded on half the days of the month at the given hour. The following conventions are used in determining the medians for hours when no measured values are given because of equipment limitations and ionospheric irregularities. Symbols used are those given in the report referred to above, IRPL-C61.

a. For all ionospheric characteristics:
Values missing because of A, B, C, or F (see terminology referred to above) are omitted from the median count.

b. For critical frequencies and virtual heights:
Values of $f^{o}F2$ (and $f^{o}E$ near sunrise and sunset) missing because of E are counted as equal to or less than the lower limit of the recorder. Values of h'F2 (and h'E near sunrise and sunset) missing for this reason are counted as equal to or greater than the median. Other characteristics missing because of E are omitted from the median count. See CRPL-F38, page 9.
Values missing because of D are counted as equal to or greater than the upper limit of the recorder.
Values missing because of G are counted:
1. For $f^{o}F2$, as equal to or less than $f^{o}F1$.
2. For h'F2, as equal to or greater than the median.
Values missing for any other reason are omitted from the median count.

c. For muf factors (M-factors):
Values missing because of G are counted as equal to or less than the median.
Values missing for any other reason are omitted from the median count.

d. For sporadic E (Es):
Values of fEs missing because no Es reflections appeared, the equipment functioning normally otherwise, are counted as equal to or less than the median $f^{o}E$, or equal to or less than the lower frequency count of the recorder.
Values of fEs missing for any other reason, and values of hEs missing for any reason at all are omitted from the median count.

Beginning with data for November 1945, doubtful monthly median values for ionospheric observations at Washington, D. C., are indicated by parentheses, in accordance with the practice already in use for doubtful hourly values. The following are the conventions used to determine whether or not a median value is doubtful:

1. If only four values or less are available, the data are considered insufficient and no median value is computed.

2. For the F2 layer, if only five to nine values are available, the median is considered doubtful. The E and F1 layers are so regular in their characteristics that, as long as there are at least five values, the median is not considered doubtful.

3. For all layers, if more than half of the values used to compute the median are doubtful (either doubtful or interpolated), the median is considered doubtful.

The same conventions are used by the CRPL in computing the medians from tabulations of daily and hourly data for stations other than Washington, beginning with the tables in IRPL-F18.

Beginning with CRPL-F33, an additional group of symbols is used in recording the Washington, D. C., data. The list of additional symbols and their meanings follows:

N - unable to make logical interpretation.
P - trace extrapolated to a critical frequency.
Q - the F1 layer not present as a distinct layer.
R - curve becomes incoherent near the F2 critical frequency.
S - no observation obtainable because of interference.
V - forked record.
Z - triple split near critical frequency.

For a more detailed explanation of the meaning and use of these symbols, see the report CRPL-7-1, "Preliminary Instructions for Obtaining and Reducing Manual Ionospheric Records."

MONTHLY AVERAGE AND MEDIAN VALUES OF WORLD-WIDE IONOSPHERIC DATA

The ionospheric data given here in tables 1 to 38 and figures 1 to 75 were assembled by the Central Radio Propagation Laboratory for analysis and correlation, incidental to CRPL predictions of radio propagation conditions. The data are median values unless otherwise indicated. The following are the sources of the data in this issue:

Australian Council for Scientific and Industrial Research,
Radio Research Board:
Canberra, Australia
Hobart, Tasmania

Canadian Radio Wave Propagation Committee:
Ottawa, Canada
St. John's, Newfoundland

New Zealand Radio Research Committee:
Christchurch, New Zealand (Canterbury University College Observatory)
Rarotonga I.

South African Council for Scientific and Industrial Research:
Capetown, Union of S. Africa

Japanese Physical Institute for Radio Waves (under supervision of
Supreme Commander, Allied Powers):
Fukaura, Japan
Shibata, Japan
Tokyo (Kokobunji), Japan
Wakkanai, Japan
Yamakawa, Japan

United States Army Signal Corps:
Okinawa I.

National Bureau of Standards (Central Radio Propagation Laboratory):
Baton Rouge, Louisiana (Louisiana State University)
Boston, Massachusetts (Harvard University)
Guam I.
Huancayo, Peru (Instituto Geofisico de Huancayo)
Maui, Hawaii
Palmyra I.
San Francisco, California (Stanford University)
San Juan, Puerto Rico (University of Puerto Rico)
Trinidad, British West Indies
Washington, D. C.
White Sands, New Mexico
Wuchang, China (National Wuhan University)

Radio Wave Research Laboratory, Central Broadcasting Administration:
Chungking, China
Lanchow, China
Nanking, China
Peiping, China

National Laboratory of Radio-Electricity (French Ionospheric Bureau):
Bagneux, France

The tables and graphs of ionospheric data are correct for the values reported to the CRPL, but, because of variations in practice in the interpretation of records and scaling and manner of reporting of values, may at times give an erroneous conception of typical ionospheric characteristics at the station. Some of the errors are due to:

a. Differences in scaling records when spread echoes are present.

b. Omission of values when $f^{o}F2$ is less than or equal to $f^{o}F1$, leading to erroneously high values of monthly averages or median values.

c. Omission of values when critical frequencies are less than the lower frequency limit of the recorder, also leading to erroneously high values of monthly average or median values.

These effects were discussed on pages 6 and 7 of the previous F-series report IRPL-F5.

The dashed-line prediction curves of the graphs of ionospheric data are obtained from the predicted zero-muf contour charts of the CRPL-D series publications. The following points are worthy of note:

a. Predictions for individual stations used to construct the charts may be more accurate than the values read from the charts since some smoothing of the contours is necessary to allow for the longitude effect within a zone. Thus, inasmuch as the predicted contours are for the center of each zone, part of the discrepancy between the predicted and observed values as given in the F series may be caused by the fact that the station is not centrally located within the zone.

b. The final presentation of the predictions is dependent upon the latest available ionospheric and radio propagation data, as well as upon predicted sunspot number.

c. There is no indication on the graphs of the relative reliability of the data; it is necessary to consult the tables for such information.

The following predicted smoothed 12-month running-average Zürich sunspot numbers were used in constructing the contour charts:

Month	Predicted Sunspot No.			
	1948	1947	1946	1945
December		126	85	38
November	115	124	83	36
October	116	119	81	23
September	117	121	79	22
August	123	122	77	20
July	125	116	73	
June	129	112	67	
May	130	109	67	
April	133	107	62	
March	133	105	51	
February	133	90	46	
January	130	88	42	

IONOSPHERIC DATA FOR EVERY DAY AND HOUR AT WASHINGTON, D. C.

The data given in tables 39 to 50 follow the scaling practices given in the report IRPL-C61, "Report of International Radio Propagation Conference," pages 36 to 39, and the median values are determined by the conventions given above under "Terminology and Scaling Practices."

IONOSPHERE DISTURBANCES

Table 51 presents ionosphere character figures for Washington, D. C., during November 1948, as determined by the criteria presented in the report IRPL-R5, "Criteria for Ionospheric Storminess," together with Cheltenham Maryland, geomagnetic K-figures, which are usually covariant with them.

Table 52 lists for the stations whose locations are given the sudden ionosphere disturbances observed on the continuous field intensity recordings made at the Sterling Radio Propagation Laboratory during November 1948.

Table 53 lists for the stations whose locations are given the sudden ionosphere disturbances observed at the Brentwood and Somerton, England, receiving stations of Cable and Wireless, Ltd., for October 22, November 7 and 14, 1948.

Table 54 gives provisional radio propagation quality figures for the North Atlantic and North Pacific areas, for 01 to 12 and 13 to 24 GCT, October 1948, compared with the CRPL daily radio disturbance warnings, which are primarily for the North Atlantic paths, the CRPL weekly radio propagation forecasts of probable disturbed periods, and the half-day Cheltenham, Maryland, geomagnetic K-figures.

The radio propagation quality figures are prepared from radio traffic and ionospheric data reported to the CRPL, in a manner basically the same as that described in IRPL-R31, "North Atlantic Radio Propagation Disturbances, October 1943 through October 1945," issued February 1, 1946. The scale conversions for each report are revised for use with the data beginning January 1948, and statistical weighting replaces what was, in effect, subjective weighting. Separate master distribution curves of the type described in IRPL-R31 were derived for the part of 1946 covered by each report; data received only since 1946 are compared with the master curve for the period of the available data. A report whose distribution is the same as the master is thereby converted linearly to the Q-figure scale. Each report is given a statistical weight which is the reciprocal of the departure from linearity. The half-daily radio propagation quality figure, beginning January 1948, is the weighted mean of the reports received for that period.

These radio propagation quality figures give a consensus of opinion of actual radio propagation conditions as reported by the half day over the two general areas. It should be borne in mind, however, that though the quality may be disturbed according to the CRPL scale, the cause of the disturbance is not necessarily known. There are many variables that must be considered. In addition to ionospheric storminess itself as the cause, conditions may be reported as disturbed because of seasonal characteristics, such as are particularly evident in the pronounced day and night contrast over North Pacific paths during the winter months, or because of improper frequency usage for the path and time of day in question. Insofar as possible, frequency usage is included in rating the reports. Where the actual frequency is not shown in the report to the CRPL, it has been assumed that the report is made on the use of optimum working frequencies for the path and time of day in question. Since there is a possibility that all the disturbance shown by the quality figures is not due to ionospheric storminess alone, care should be taken in using the quality figures in research correlations with solar, auroral, geomagnetic, or other data. Nevertheless, these quality figures do reflect a consensus of opinion of actual radio propagation conditions as found on any one half day in either of the two general areas.

AMERICAN AND ZÜRICH PROVISIONAL RELATIVE SUNSPOT NUMBERS

Table 55 presents the daily American relative sunspot number, R_A, computed from observations communicated to CRPL by observers in America and abroad. Beginning with the observations for January 1948, a new method of reduction of observations is employed such that each observer is assigned a scale-determining "observatory coefficient," ultimately referred to Zürich observations in a standard period, December 1944 to September 1945, and a statistical weight, the reciprocal of the variance of the observatory coefficient. The daily numbers listed in the table are the weighted means of all observations received for each day. Details of the procedure will be published shortly. The American relative sunspot number computed in this way is designated R_A. It is noted that a number of observatories abroad, including the Zürich observatory, are included in R_A. The scale of R_A was referred specifically to that of the Zürich relative sunspot numbers in the standard comparison period; since that time, R_A is influenced by the Zürich observations only in that Zürich proves to be a consistent observer and receives a high statistical weight. In addition, this table lists the daily provisional Zürich sunspot numbers, R_Z.

SOLAR CORONAL INTENSITIES OBSERVED AT CLIMAX, COLORADO

In tables 56a and 56b are listed the intensities of the green (5303A) line of the emission spectrum of the solar corona as observed during November 1948 by the High Altitude Observatory of Harvard University and the University of Colorado at Climax, Colorado, for east and west limbs, respectively, at 5° intervals of position angle north and south of the solar equator at the limb computed to the nearest 5°. A correction, P, as listed, has been applied to the position angles of the actual observations which were on astronomical coordinates. The time of observation is given to the nearest tenth of a day, GCT. The tables of coronal observations in CRPL-F29 to F41 listed the data on astronomical coordinates; the present format on solar rotation coordinates is in conformity with the tables of CRPL-1-4, "Observations of the Solar Corona at Climax, 1944-46."

Tables 57a and 57b give similarly the intensities of the first red (6374A) coronal line; tables 58a and 58b list the intensities of the second red (6704A) coronal line. The following symbols are used in tables 56, 57, and 58: a, observation of low weight; -, corona not visible; and x, position angle not included in plate estimates.

ERRATUM

1. CRPL-F51, p. 18, table 32: f^{o}E column at 06 should read "E." Correspondingly, no point should be plotted at that hour on the graph.

INDEX OF IONOSPHERIC DATA PUBLISHED IN 1948 (CRPL-F41 THROUGH F52)

The following index of tables and graphs of ionospheric data published in the CRPL-F series in 1948 is divided into three parts. Part I is an index of data observed in 1947 and 1948. Part II is an index of data observed prior to 1947. Part III is an index to errata published in 1948 concerning numerical data from ionospheric stations.

Both table and graph for the given station for a given month appear in the same issue. When data for the same station and month have been published in two issues of the F series, both issue numbers are given in the index, even though one issue was published prior to 1948.

Indexes of ionospheric data published prior to 1948 are in IRPL-F17, CRPL-F28 and F40.

PART I

Index of Tables and Graphs of Ionospheric Data Observed in 1947 and 1948 and Published in 1948 (CRPL-F41 through F52)

Station	1947												1948											
	J	F	M	A	M	J	JY	A	S	O	N	D	J	F	M	A	M	J	JY	A	S	O	N	D
Agassiz, Canada											41	42	44*	44	45	46	47							
													43											
Bagneux, France							42	42	42		48*	50*	51	52	52	52								
Baton Rouge, Louisiana											41	42	43	46	45	46	47	48	49	50	51	52		
Bocayuva, Brazil					41																			
Bombay, India							41	42	42	45	45	46	46	47	49	49	49	51						
Boston, Massachusetts											41	42	43	44	45	46	47	48	49	50	51	52		
Brisbane, Australia									41	43	44	44	46	46	47	48	49	49	51					
Canberra, Australia									41	44	44	44	45	46	47	48	49	49	51	52				
Capetown, Union of S. Africa																			51		52			
Christchurch, New Zealand										41	43	44	45	45	46	48	48	49	50	52	52			
Chungking, China										42	44	45	45	46	47	48	48	49	50*	51	52			
Churchill, Canada											42	42	43	45	46	46*	47							
Clyde, Baffin I.	47	47	47	47	47	47	47	47	47	47	47	47	47*											
	32	33	34	34	35	36	38	38	39	40	41	42	43	45	46									
Delhi, India							41	42	42	45	45	46	46	47	49	49	49	51						
Fairbanks, Alaska											41	42	43	44	45	46	47	48						
Falkland Is.								41	43	43	45	46	47	47	49	49	50							
Fiji Is.									41	42	44	44	45		48									
Fraserburgh, Scotland															47	49	49	50						
Fribourg, Germany	42	43	43	43	46	44	46	47	47	48	48	48	51	51	51									
Fukaura, Japan									41	41	43	44	45	46	46	48	48	49	50	52	52			
Guam I.										41	41	42	43	44	45	46	47	48	49	50	51	52		
Hobart, Tasmania									41	44	44	44	45	47	47	48	49	51	51	52				
Huancayo, Peru							41	41	41	41	42	42	45	45	46	47	48	48	49	50	51	52		
Johannesburg, Union of S. Africa										41	42	44	44	45	46	47	48	48	50	50	51			
Lanchow, China									42	44	45	45	45	47	48	48	49	50	51	52				
Leyte, Philippine Is.									41	41	42	43	44	46	46	47	48	48	50	51				
Lindau/Harz, Germany												46	46		46	48	48	50		50	51			
Madras, India							41	42	42	45	45	46	46	47	49	49	49	51						
Maui, Hawaii											41	42	43	44	45	46	47	48	48	50	51	52		
Nanking, China										42	46	45*	47	47	48	48	49	50	51	52				
Okinawa I.										41	42	42	44	47*	46	47	48	48	50	50	52	52		
Ottawa, Canada											41	42	43	45	46	46	47	48	50	50	51	52		
Palmyra I.											41	42	43	44	45	46	47	48	49	51	51	52		
Peipang, China										42*	44*	45	45	46	47	48	48	49	50*	51	52			
Portage la Prairie, Canada										41	41	42	43	45	46	46	47	48						
Prince Rupert, Canada										41	41	43	44	45	46	46	47	48						
Rarotonga I.								41	41	44	44	44	45	48			49	50	52	52				
St. John's, Newfoundland											41	42	43	45	46	46	47	48	50	50	51	52		
San Francisco, California											41	42	43	44	45	46	47	48	49	50	51	52		
San Juan, Puerto Rico											41*	42	43	44	45	46	47	48	49	50	51	52		
Shibata, Japan										41	43	43	44	46	46	48	48	49	50		52			
Slough, England									41	43	45	45	46	47	47	49	49	50						
Tokyo, Japan										42	43	43	44	46	46	48	48	49	50	52	52			
Townsville, Australia								41	42	44	44	44	45											
Trinidad, Brit. West Indies											41	42	43	44	45	46	47	48	49	50	51	52		
Wakkanai, Japan										41	43	43	44	46	46	48	48	49	50	52	52			
Washington, D. C.												41	42	43	44	45	46	47	48	49	50	51	52	
Watheroo, W. Australia										41	43	44	44	46	47		49		50	51				
White Sands, New Mexico											41*	42	44	44	45	46	47	48	49	50	51	52		
Wuchang, China											42	42	43	44	46	46	48	48	49	50	51	52		
Yamakawa, Japan										41	43	43	44	46	46	48	48	49	50	52	52			

***See part III for index to errata on these data.**

PART II

Index of Tables and Graphs of Ionospheric Data Observed Prior to 1947 and Published in 1948 (CRPL-F41 through F52)

Station	Month and year of data	F issue
Burghead, Scotland	March 1942 through December 1942	43
Canberra, Australia	January 1940 through December 1940	43
	January 1939 through December 1939	42
	January 1938 through December 1938	44
	March 1937 through December 1937	45
Christchurch, New Zealand	August 1942 through October 1942	44
Delhi, India	January 1942 through December 1942	42
Fribourg, Germany	October 1946 through December 1946	41
Great Baddow, England	January 1942 through December 1942	43
Tromso, Norway	June 1944 through April 1945	45
	August 1943	45

PART III

Index of Errata Published in 1948* Concerning Numerical Data from Ionosphere Stations

Station	Month and year of data	F issue	Page	Erratum No.
Adak, Alaska	January 1948	44	9	1
Bagneux, France	December 1947	51	10	3
	November 1947	49	8	2
Chungking, China	July 1948	51	10	2
Churchill, Canada	April 1948	47	10	1
Clyde, Baffin I.	January 1948	49	8	1
Fribourg, Germany	March 1948	52	9	1
Nanking, China	December 1947	46	9	1
Okinawa I.	February 1948	50	9	1
Peiping, China	July 1948	51	10	1
	July 1946 through November 1947	46	9	3
San Juan, Puerto Rico	November 1947	42	9	1
Tromso, Norway	August 1943	46	9	2
White Sands, New Mexico	November 1947	42	9	2

*An individual erratum may refer to issues prior to CRPL-F41.

TABLES OF IONOSPHERIC DATA

Table 1

Washington, D. C. (39.0°N, 77.5°W) November 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	250	4.8						(2.9)
01	250	(4.6)						(2.9)
02	250	(4.3)						2.8
03	250	(4.2)						(2.9)
04	250	(4.0)						(2.9)
05	250	3.8						2.9
06	255	3.7						2.9
07	240	6.3			110	2.0		3.2
08	230	9.0			100	(2.4)	2.6	3.4
09	230	10.4	210		100	2.9	2.9	3.3
10	230	11.5	200		100	3.1	3.0	3.2
11	230	12.0	210		100	3.3	2.2	3.1
12	240	12.4	210		100	3.4	2.8	3.1
13	235	12.4	215		100	3.4		3.1
14	230	12.1	220		100	3.2		3.1
15	230	11.9	220		100	2.9		3.2
16	230	(11.6)			110	2.3	2.3	(3.2)
17	220	(10.3)					1.9	(3.2)
18	210	(9.3)					1.9	(3.1)
19	220	8.6						3.1
20	225	7.0						3.1
21	240	6.5						3.0
22	250	5.8						3.0
23	250	5.3						3.0

Time: 75.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 2

St. John's, Newfoundland (47.6°N, 52.7°W) October 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	280	3.4					1.5	3.0
01	280	3.6					1.4	3.0
02	280	3.5						3.0
03	280	3.5					1.8	3.0
04	280	3.2						3.0
05	280	3.1						3.1
06	260	4.4						3.1
07	245	6.8			120	2.2	1.4	3.2
08	240	8.4			120	2.5		3.2
09	230	9.9	230	4.4	120	2.9	2.2	3.1
10	240	10.2	230	4.6	120	3.0		3.0
11	230	11.2	230	4.5	120	3.2	3.0	3.0
12	230	11.7	220	4.5	110	3.2		3.0
13	230	11.7	235	4.6	120	3.2		3.0
14	240	11.6			120	3.2		2.9
15	240	11.8		4.4	120	2.9		3.0
16	240	11.6			120	2.5		3.0
17	240	11.0			125	2.0		3.0
18	230	10.0					1.4	3.0
19	230	7.2						3.0
20	245	6.1						3.0
21	260	5.6						3.0
22	270	4.5						3.0
23	280	3.5					1.6	3.0

Time: 52.5°W.
Sweep: 1.2 Mc to 20.0 Mc, manual operation.

Table 3

Ottawa, Canada (45.5°N, 75.8°W) October 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	320	4.1						2.8
01	340	4.1						2.8
02	320	3.8						2.8
03	310	3.8						2.8
04	330	3.6						2.9
05	320	3.7						2.9
06	300	4.6						2.9
07	260	6.8						2.9
08	240	8.4						3.0
09	240	9.8						3.0
10	240	10.4						2.9
11	250	10.6	210	5.2				2.9
12	260	11.1	230	5.1				2.9
13	250	11.2	235	4.8				2.8
14	250	11.6	235	4.7				2.8
15	250	11.8						2.9
16	240	11.6						2.9
17	240	11.0						2.9
18	240	10.1						2.9
19	240	8.1						2.8
20	250	7.0						2.8
21	270	6.2						2.8
22	280	5.1						2.8
23	290	4.6						2.8

Time: 75.0°W.
Sweep: 1.7 Mc to 18.0 Mc, manual operation.

Table 4

Boston, Massachusetts (42.4°N, 71.2°W) October 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	300	5.2						2.5
01	300	4.7					1.4	2.6
02	280	4.5					1.2	2.6
03	282	4.5					1.2	2.6
04	265	4.3					1.2	2.6
05	272	4.0					1.2	2.6
06	260	5.4						2.8
07	245	7.6						3.0
08	248	9.7						3.0
09	250	10.0						3.0
10	250	10.0						3.0
11	250	10.0						3.0
12	260	9.3						2.9
13	250	9.6						3.0
14	255	9.8						3.0
15	250	9.8						3.0
16	250	10.0						3.0
17	250	9.7						3.0
18	250	9.3						2.8
19	252	7.5						2.8
20	260	6.9						2.6
21	275	6.8						2.6
22	280	6.0						2.6
23	295	5.7						2.6

Time: 75.0°W.
Sweep: 0.8 Mc to 14.0 Mc in 1 minute.

Table 5

San Francisco, California (37.4°N, 122.2°W) October 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	280	4.1						2.5
01	300	4.1						2.5
02	300	4.3						2.5
03	300	4.3						2.6
04	300	4.2					2.2	2.6
05	320	3.9						2.5
06	280	4.8					2.5	2.6
07	240	7.6			120	2.3		3.1
08	240	9.8			120	2.8		3.1
09	230	10.7	230		120	3.3		3.0
10	240	11.5	215		120	3.6		2.8
11	240	11.9	210		120	3.6		2.8
12	240	12.5	220		110	3.6		2.7
13	240	12.5	235		110	3.6		2.7
14	240	12.5	220		110	3.5		2.7
15	240	12.3			120	3.3		2.7
16	240	11.7			120	2.7		2.8
17	220	10.7			120	2.3		3.0
18	220	9.2					2.6	3.0
19	220	7.7					2.4	2.9
20	240	5.8					2.4	2.9
21	260	4.8						2.8
22	280	4.4						2.7
23	280	4.1						2.6

Time: 120.0°W.
Sweep: 1.3 Mc to 18.5 Mc in 4 minutes 30 seconds.

Table 6

White Sands, New Mexico (32.3°N, 106.5°W) October 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	300	4.8					2.4	2.6
01	300	4.8					2.6	2.6
02	280	4.7					2.5	2.6
03	280	4.6					2.5	2.7
04	290	4.5					3.0	2.6
05	300	4.4					2.8	2.6
06	280	5.0					3.3	2.7
07	240	8.1			120	2.3	3.7	3.0
08	240	9.8			120	2.8	3.6	3.1
09	230	11.1			120	3.2	4.0	3.0
10	230	11.9			120	3.4		2.9
11	220	12.0	220		120	3.6		2.9
12	240	(12.0)	220		110	3.6		(2.9)
13	230	12.1			110	3.6		2.8
14	240	12.3			110	3.5	3.6	2.8
15	240	12.0			120	3.2	4.3	2.9
16	240	11.9			110	2.7	3.7	2.9
17	230	11.3			110	(2.1)	3.8	3.0
18	220	9.9					3.1	3.0
19	220	7.6					3.3	2.9
20	240	6.3					2.9	2.9
21	260	5.3					2.4	2.7
22	280	4.9					2.5	2.7
23	280	4.7					2.3	2.6

Time: 105.0°W.
Sweep: 0.79 Mc to 14.0 Mc in 2 minutes.

Table 7

Wuchang, China (30.6°N, 114.4°E) October 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	260	7.4					2.8	2.9
01	250	6.7					2.4	2.9
02	250	6.3					2.4	3.0
03	245	5.6					2.1	3.0
04	242	4.8					2.1	2.8
05	260	4.4						2.8
06	265	5.1						2.9
07	230	9.8			120	2.1		3.3
08	225	11.5			105	2.7	3.0	3.3
09	225	12.5			100	3.1		3.2
10	225	13.2	212	4.6	100	3.4		3.1
11	220	14.0	225	5.2	100	3.5		3.0
12	240	14.7	210	5.8	100	3.6		3.0
13	250	15.5	218	6.4	100	3.7		2.9
14	240	15.7	222	5.0	100	3.6		3.0
15	235	15.5	225	5.2	100	3.5		3.0
16	230	15.2			105	3.1		3.0
17	235	14.8			110	2.6	3.0	3.1
18	222	14.1			100	1.8	3.0	3.1
19	225	12.4					3.2	3.0
20	230	11.2					3.2	3.0
21	240	10.0					3.2	2.9
22	240	8.7					2.8	3.0
23	270	7.4					3.0	2.8

Time: 120.0°E.
Sweep: 1.2 Mc to 19.0 Mc in 15 minutes, automatic operation.

Table 8

Baton Rouge, Louisiana (30.5°N, 91.2°W) October 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	290	5.5						2.9
01	290	5.3						2.9
02	280	5.0						2.9
03	290	4.9						2.9
04	290	4.8						2.9
05	290	5.0						2.9
06	270	5.7						3.0
07	265	8.5			120	2.6		3.2
08	260	10.0	230		120	3.0		3.1
09	280	10.8	230		120	(3.2)		3.0
10	285	12.1	230		120	(3.4)		3.0
11	290	12.1	230		120	(3.6)		3.0
12	290	12.6	230		120	3.7		3.0
13	290	12.5	230		120	3.6		3.0
14	290	12.6	240		120	3.5		3.0
15	290	12.6	230		120	3.2		3.0
16	280	12.0	240		120	3.0		3.0
17	260	11.1			120	2.4		3.1
18	230	9.8						3.1
19	235	7.8						3.1
20	250	6.5						3.0
21	270	5.8						2.9
22	280	5.6						2.9
23	290	5.3						2.9

Time: 90.0°W.
Sweep: 2.12 Mc to 15.3 Mc in 8 minutes 30 seconds, automatic operation.

Table 9

Okinawa I. (26.3°N, 127.7°E) October 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00		10.6					3.2	3.0
01		9.5						(3.0)
02		8.0						3.0
03		6.4						(2.9)
04		5.6						3.0
05		5.3						2.7
06		5.6						2.8
07		9.1						3.2
08		11.8					4.0	3.3
09		13.7					4.4	3.2
10		14.4					4.4	(3.1)
11		15.1					4.4	(3.0)
12		15.4					5.0	(2.9)
13		16.2					4.5	(2.9)
14		16.9					4.4	(2.9)
15		17.0					4.3	(2.9)
16		16.3					4.3	(3.0)
17		16.4					4.0	3.0
18		15.7					4.0	(3.1)
19		14.6					4.2	2.9
20		14.9					3.8	(2.9)
21		14.8					3.6	3.0
22		13.2						3.0
23		11.2					3.2	3.0

Time: 135.0°E.
Sweep: 3.2 Mc to 18.0 Mc in 15 minutes, manual operation.

Teble 10

Maui, Hawaii (20.8°N, 156.5°W) October 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	210	9.4						3.2
01	205	7.6						3.3
02	215	5.5						3.0
03	240	4.9						2.8
04	260	4.1						2.8
05	280	3.6						2.8
06	290	4.5						2.8
07	230	8.5			120	2.5		3.4
08	230	11.2			110	3.0		3.2
09	230	12.5	200		110	3.4		3.2
10	250	13.7	220		110	3.5		3.1
11	250	15.0	200		100	3.6	4.4	3.0
12	290	15.6	200		100	3.8	4.6	3.0
13	290	16.2	210		105	3.8	4.3	3.0
14	270	16.8	210		100	3.7		3.1
15	250	15.8	220		100	3.4	4.6	3.0
16	240	16.1	220		100	3.0	4.5	3.0
17	230	15.0			100	2.5	4.3	3.1
18	210	13.4			100		4.1	3.2
19	210	13.0					4.6	3.2
20	220	11.2					3.2	3.0
21	240	12.0					2.9	3.1
22	230	11.4						3.2
23	230	9.8						3.2

Time: 150.0°W.
Sweep: 2.2 Mc to 16.0 Mc in 1 minute; above 16.0 Mc, manual operetion

Teble 11

San Juan, Puerto Rico (18.4°N, 66.1°W) October 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00		8.2						2.9
01		8.0						3.0
02		7.0						3.0
03		5.3						2.8
04		5.0						2.8
05		4.9						2.8
06		5.6						2.9
07	230	9.0		3.5				3.2
08	250	11.0				3.0		3.1
09	260	12.5				3.4		3.0
10	270	13.2				3.8		3.0
11	280	13.0				3.9		2.9
12	300	13.1				3.9		2.8
13	300	(13.0)				3.9		(2.8)
14	300	13.0				3.8		2.8
15	285	13.0				3.6	4.9	2.8
16	280	12.5				3.2	4.6	2.8
17	260	12.0				3.2		2.9
18	250	11.1						2.9
19	250	(10.1)						2.9
20		9.2						2.8
21		8.8						2.9
22		8.4						2.9
23		8.3						2.8

Time: 60.0°T.
Sweep: 2.5 Mc to 13.0 Mc in 9 minutes, supplemented by manual operetion.

Table 12

Guam I. (13.6°N, 144.9°E) October 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	240	13.6					3.8	3.0
01	240	13.0					4.6	3.2
02	230	11.2					3.0	3.3
03	220	8.6					5.0	3.1
04	230	7.5					4.1	3.1
05	230	6.7					4.9	3.2
06	245	7.2					4.4	3.0
07	250	10.3					4.6	3.1
08	240	12.7					5.0	3.0
09	230	13.9					5.5	2.6
10	220	13.7					5.0	2.5
11	220	13.6					5.0	2.4
12	220	13.7					5.0	2.4
13	220	14.0					5.0	2.4
14	220	14.6					4.8	2.6
15	230	15.4					5.0	2.6
16	240	16.1					5.0	2.6
17	250	16.0					5.5	2.6
18	270	15.8					5.0	2.6
19	330	14.6					4.6	2.4
20	320	15.0					4.6	2.4
21	260	14.6					4.6	(2.4)
22	260	(13.8)					4.6	(3.0)
23	250	13.4					2.8	(2.9)

Time: 150.0°E.
Sweep: 1.25 Mc to 19.0 Mc in 12 minutes, manual operation.

Teble 13

Trinidad, Brit. West Indies (10.6°N, 61.2°W) October 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	250	9.4						3.0
01	235	8.4						3.2
02	225	6.8						3.0
03	250	4.6						2.8
04	280	4.2						2.7
05	295	4.4					2.0	2.8
06	260	6.2			110	1.8	2.4	3.1
07	240	9.6			120	2.7	3.0	3.2
08	240	11.8			120	3.2	3.6	3.1
09	260	13.3	230	4.9	120	3.6	4.2	3.1
10	260	13.7	220	6.1	120	3.8	4.6	3.0
11	270	13.7	220	5.2	120	4.0	4.8	2.9
12	270	13.9	220	5.3	120	4.0	4.7	2.9
13	270	14.0	220	5.2	120	3.9	4.8	2.8
14	270	13.6	226	5.2	120	3.8	5.3	2.8
15	270	13.0	230	5.2	120	3.6	5.3	2.7
16	270	13.0	240	5.0	120	3.1	5.0	2.7
17	250	12.9			110	2.4	4.7	2.8
18	260	12.6					4.2	2.8
19	260	11.8					3.7	2.9
20	250	11.2					2.8	2.8
21	250	10.7					2.4	2.8
22	270	10.2						2.8
23	260	10.2						2.9

Time: 60.0°W.
Sweep: 1.2 Mc to 18.0 Mc, manual operation.

Table 14

Palmyra I. (5.9°N, 162.1°W) October 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	250	12.4					3.0	3.1
01	240	11.3					2.9	(2.9)
02	240	10.1					3.1	3.0
03	240	8.7					3.4	(3.0)
04	250	8.0					3.9	2.8
05	250	7.2					3.8	2.8
06	290	7.3					3.5	2.8
07	270	9.7			130	2.7	4.0	2.8
08	250	11.9			120	3.4	4.2	2.6
09	270	12.7	240		120	3.7	4.4	2.5
10	270	12.3	230		120	3.8	4.5	2.4
11	270	12.5	220		120	4.1	4.2	2.4
12	270	13.0	230		120	4.2		2.4
13	270	13.7	230		120	4.2		2.5
14	270	14.3	230		120	4.0	4.3	2.5
15	260	14.7	230		120	3.7	4.3	2.5
16	250	14.8	240		120	3.3	4.3	2.5
17	260	14.5			120	2.7	4.2	2.5
18	290	14.5			120	1.8	4.0	2.5
19	350	14.1					3.9	2.3
20	340	13.1					3.5	(2.3)
21	310	13.2					3.8	(2.6)
22	270	13.5					3.1	2.6
23	260	13.6					4.0	2.8

Time: 157.5°W.
Sweep: 1.0 Mc to 13.0 Mc in 1 minute 36 seconds, automatic operation; 13.0 Mc to 18.0 Mc, manual operation.

Table 15

Huancayo, Peru (12.0°S, 75.3°W) October 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	240	10.2						2.9
01	250	8.6						3.0
02	250	7.7						2.9
03	260	6.9						3.0
04	250	6.4						3.0
05	250	5.9						3.0
06	260	8.8				2.3		3.0
07	250	11.8				3.0		3.0
08	240	13.6				3.5	11.8	2.8
09	230	14.0	220	5.4		3.9	12.2	2.5
10	270	13.5	230	5.5		4.2	12.0	2.3
11	220	12.9	210	5.4		4.2	12.1	2.2
12	230	12.3	210	5.4			12.0	2.2
13	220	12.0	210	5.2			12.0	2.2
14	220	12.3					12.0	2.2
15	230	12.4				3.6	11.9	2.2
16	250	12.5				3.2	11.9	2.2
17	270	12.6				2.5	8.3	2.2
18	300	12.0				1.3		2.2
19	400	11.0						2.1
20	390	11.1						2.2
21	340	10.8						2.3
22	280	10.7						2.8
23	260	11.4						2.8

Time: 75.0°W.
Sweep: 16.0 Mc to 0.5 Mc in 15 minutes, automatic operation.

Table 16

Wakkanai, Japan (45.4°N, 141.7°E) Saptember 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	300	6.3					2.2	2.6
01	280	6.1					2.2	2.7
02	280	5.8					2.2	2.7
03	270	5.8					2.2	2.7
04	270	5.6					2.1	2.6
05	280	5.7				E	2.1	2.7
06	230	7.4			100	2.2	2.8	3.1
07	250	8.8			100	2.8	3.4	3.1
08	230	10.8			100	3.3	3.4	3.1
09	240	10.0			100	3.2	3.6	3.1
10	260	10.3	220		100		3.9	3.1
11	270	10.1	210		100		(3.4)	2.9
12	285	10.8	220		(100)			3.0
13	275	11.0	210		(100)			3.0
14	280	10.2	220		100	3.5		2.9
15	270	9.7	220		100	3.3		3.0
16	250	9.7	230		100	3.0	3.1	3.1
17	250	9.2	220		100	2.4	3.3	3.1
18	230	8.8			100	1.9	3.0	3.1
19	230	8.0					2.9	3.0
20	250	7.7					3.2	2.9
21	240	6.7					2.8	2.8
22	270	6.6					2.4	2.7
23	270	6.5					2.4	2.6

Time: 135.0°E.
Sweep: 1.0 Mc to 17.0 Mc, manual oparation.

Table 17

Fukaura, Japan (40.6°N, 139.9°E) September 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	300	6.6					2.4	2.6
01	300	6.6					2.6	2.6
02	290	6.6					2.4	2.7
03	290	6.2					2.4	2.7
04	280	5.9					2.4	2.7
05	280	6.2				E	2.3	2.7
06	240	8.2			110	2.2	2.9	3.2
07	230	9.8	220		110	2.7	3.2	3.2
08	250	10.2	220				4.0	3.2
09	250	9.8	220		115	3.4	4.4	3.1
10	250	10.4	220				4.3	3.0
11	290	10.6	240				4.6	3.0
12	290	11.0	225				(4.6)	2.9
13	300	11.1	230				(3.8)	2.9
14	300	10.5	230				(3.8)	2.8
15	270	10.4	240		110	3.2	3.5	2.9
16	260	10.3			110	2.7	3.2	3.0
17	255	10.2			110	2.4	3.2	3.0
18	250	9.8					3.4	3.0
19	250	8.8					(2.0)	2.8
20	(250)	8.4					(3.0)	2.8
21	270	7.2					2.8	2.7
22	300	7.1					2.8	2.7
23	290	7.0					3.0	2.6

Time: 135.0°E.
Sweep: 1.0 Mc to 17.0 Mc, manual operation.

Table 18

Peiping, China (39.9°N, 116.4°E) September 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00								
01								
02		7.3						
03		7.2						
04		7.1						
05		6.9						
06		7.6						
07		9.0						
08								
09								
10		11.4						
11		11.3						
12		11.4						
13		11.5						
14		11.5						
15		11.4						
16								
17								
18		10.4						
19		9.4						
20		8.2						
21		7.8						
22		8.0						
23		7.6						

Time: 120.0°E.
Sweep: 2.3 Mc to 13.5 Mc in 15 minutes, manual operation.

Table 19

Shibata, Japan (37.9°N, 139.3°E) September 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	280	6.7					2.6	2.7
01	275	6.6					2.4	2.8
02	270	6.4					2.3	2.8
03	255	6.1					2.2	2.8
04	260	6.0					2.4	2.8
05	270	6.0	220			(1.1)	2.8	2.9
06	220	8.7	220		100	(2.1)	2.8	3.3
07	215	10.1	216		100	2.9	3.8	3.4
08	220	10.6	210		100	3.2	4.0	3.3
09	225	10.8	200		100	3.4	4.7	3.3
10	230	10.4	200		100	3.8	4.2	3.1
11	260	10.9	190		100	3.9	4.3	3.1
12	270	11.6	200		100	3.8	4.3	3.0
13	272	11.5	195		100	3.9	3.9	3.0
14	250	11.0	200		100	3.8	3.8	3.1
15	250	11.2	210		100	3.5	3.9	3.1
16	240	10.9	220		100	3.1	3.7	3.2
17	220	10.6	200		100	2.4	3.8	3.2
18	220	10.0	205			(1.7)	3.2	3.3
19	220	8.6					2.9	3.2
20	240	7.4					3.0	3.0
21	250	6.9					2.8	2.8
22	280	7.0					2.9	2.8
23	270	7.0					2.6	2.8

Time: 135.0°E.
Sweep: 1.0 Mc to 17.0 Mc in 15 minutes, manual operation.

Table 20

Tokyo, Japan (35.7°N, 139.5°E) September 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	300	6.8					2.3	2.7
01	300	6.8					2.2	2.7
02	280	6.5					2.2	2.9
03	260	6.2					1.9	2.8
04	270	5.8					2.0	2.8
05	280	6.0				E	2.1	2.8
06	240	8.3			100	2.2	2.7	3.3
07	240	10.5	215		110	2.8	3.6	3.3
08	240	10.7	230		100	3.2	4.0	3.3
09	250	10.8	230		100	3.4	4.8	3.1
10	250	10.8	220		100		5.0	3.0
11	280	11.5	240		100		(5.4)	2.9
12	285	11.9	250		100		(5.4)	2.9
13	300	12.0	235		100		(4.6)	2.9
14	300	11.8	240		100	3.6	4.2	3.0
15	280	11.8	245		100	3.4	4.0	2.9
16	270	11.4	250		100	3.2	4.0	3.0
17	250	10.8	240		110	2.6	3.6	3.1
18	240	10.1			105	1.8	3.3	3.2
19	230	8.5					3.4	3.2
20	250	7.6					3.2	2.9
21	275	7.0					3.3	2.8
22	290	6.9					3.1	2.8
23	290	6.9					3.2	2.8

Time: 135.0°E.
Sweep: 1.0 Mc to 17.0 Mc in 15 minutes, manual operation.

Table 21

Yamakawa, Japan (31.2°N, 130.6°E) September 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	280	8.0					2.6	2.8
01	285	7.8						2.8
02	280	7.3						2.7
03	255	6.8						2.9
04	270	6.2						2.9
05	280	5.9	260			E		2.8
06	285	6.8	270			E	2.4	2.9
07	230	9.8	225		110	2.4	3.0	3.3
08	230	10.4	220		110	3.0	3.6	3.2
09	240	10.3	220		110	3.5	4.9	3.2
10	260	10.7	220				5.0	3.0
11	290	11.7	220	5.6			(5.4)	2.8
12	300	12.8	220	6.0			(5.5)	2.8
13	300	13.1	230	5.6			(5.2)	2.8
14	300	13.3	250				(4.9)	2.8
15	290	13.1	230	5.0	110		5.1	2.9
16	280	13.1	235		110	3.4	4.0	2.9
17	270	12.8	240		110	2.6	4.2	3.0
18	250	11.9	240			2.1	3.8	3.0
19	230	10.9					3.4	3.0
20	230	8.9					3.2	2.9
21	270	8.8					3.0	2.7
22	285	8.2					2.8	2.8
23	290	8.5					2.6	2.7

Time: 135.0°E.
Sweep: 0.6 Mc to 18.5 Mc in 15 minutes, manual operation.

Table 22

Chungking, China (29.4°N, 106.8°E) September 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	260	9.2					2.6	2.6
01	260	8.5					2.4	2.7
02	260	7.4					2.2	2.9
03	240	6.6					2.4	2.9
04	230	5.4					2.4	2.7
05	250	5.2					2.3	2.7
06	260	6.8					2.9	2.9
07	240	9.6	225		110	2.7	4.4	3.2
08	240	10.7	230		100	3.2	4.7	3.1
09	260	10.9	220		100	3.2	5.2	2.9
10	260	11.5	210		100	3.8	4.8	2.8
11	290	13.0	205	6.6	100	4.2	4.8	2.7
12	320	14.7	220	6.0	120	4.2	4.5	2.6
13	325	15.8	220	6.0	120	4.0	4.8	2.6
14	320	16.2	220	5.6	120	4.0	4.8	2.6
15	280	16.6	230	5.3	90	3.6	4.6	2.8
16	280	15.5	240	5.2	100	3.2	4.4	2.8
17	240	15.3	235		90	2.8	4.0	2.8
18	250	15.3	240				3.8	2.8
19	240	14.5					4.0	2.8
20	240	13.2					2.6	2.7
21	250	12.0					3.3	2.6
22	240	10.5					3.0	2.7
23	260	9.6					1.8	2.6

Time: 105.0°E.
Sweep: 1.7 Mc to 20.0 Mc in 15 minutes, manual operation.

Table 23

Okinawa I. (26.3°N, 127.7°E) September 1948*

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00		(12.3)						(3.1)
01		14.8						3.2
02		(11.0)						(2.9)
03		8.5						3.0
04		7.2						3.0
05		6.6						2.8
06		7.0						2.9
07		9.6					3.4	3.3
08		10.5					4.0	3.2
09		10.9					4.4	3.1
10		12.0					4.9	2.9
11		12.8					4.6	2.8
12		14.6					4.6	2.9
13		15.3					4.6	2.8
14		15.4					4.4	2.8
15		16.4					4.6	2.8
16		16.4					5.0	2.9
17		16.4					4.9	3.1
18		14.5					4.1	3.0
19		14.4					4.6	2.8
20		(15.9)						2.9
21		14.2						2.9
22		(15.5)						(2.8)
23		(15.3)						(2.9)

Time: 135.0°E.
Sweep: 2.0 Mc to 18.0 Mc in 15 minutes, manual operation.
*Data taken September 11 through 30, only.

Table 24

Capetown, Union of S. Africa (34.2°S, 18.3°E) September 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	(270)	4.0						2.9
01	(280)	4.0						2.8
02	(290)	3.9						2.8
03	(270)	3.8						2.8
04	(270)	3.8						2.8
05	(280)	3.9						2.8
06	(285)	4.0						2.8
07	240	7.0				2.0		3.2
08	240	9.2			120	2.9		3.2
09	250	10.4	240		110	3.2		3.1
10	270	10.9	230		110	3.4		3.0
11	270	11.9	230	(4.8)	110	3.5		2.9
12	280	12.4	220	5.0	110			2.8
13	290	12.6		5.2	110			2.8
14	290	12.4	230	5.0	110	3.6		2.8
15	290	12.0	240		110	3.5		2.8
16	275	12.0	240	4.0	110	3.3	3.4	2.8
17	260	11.8	240		120	2.9	2.7	2.9
18	250	11.4			120	2.2	2.1	2.9
19	230	10.6					1.8	3.0
20	220	8.8					1.6	3.0
21	230	7.6					1.6	3.0
22	240	6.1						3.1
23	(250)	4.6						3.0

Time: 30.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 7 seconds.

Table 25

Christchurch, New Zealand (43.6°S, 172.7°E) September 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	280	5.7					2.6	2.6
01	280	5.6					2.6	2.6
02	280	5.0					2.7	2.7
03	280	4.8					2.7	2.7
04	280	4.3					2.6	2.7
05	290	3.8					2.6	2.7
06	280	4.6				1.4	2.6	2.9
07	250	6.4				2.1	2.6	3.1
08	250	7.8	250	(4.2)		2.7		3.1
09	260	8.1	240	4.5		3.1	3.9	3.0
10	270	9.3	230	4.8		3.4		2.9
11	280	9.4	230	5.0		3.5		2.9
12	280	10.1	230	5.0		3.5	3.8	2.9
13	280	9.8	230	5.0		3.5		2.9
14	280	9.4	230	4.8		3.4		2.8
15	270	9.6	230	4.2		3.2		2.9
16	250	9.0	240	3.6		2.8		2.9
17	250	8.8				2.1	2.7	2.8
18	250	8.3				1.3	2.5	2.8
19	250	7.9					2.5	2.7
20	266	7.2					2.5	2.7
21	270	6.6					2.1	2.7
22	280	6.4					2.5	2.6
23	280	6.0					2.5	2.7

Time: 172.5°E.
Sweep: 1.0 Mc to 13.0 Mc.

Table 26

Wakkanai, Japan (45.4°N, 141.7°E) August 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	290	7.0					3.2	2.7
01	290	6.8					2.7	2.7
02	280	6.6					2.6	2.7
03	280	6.4					2.8	2.7
04	290	6.1				E	2.7	2.7
05	280	6.4	250		100	1.8	2.8	2.8
06	290	7.5	220	4.2	100	2.5	3.6	2.9
07	290	7.9	220	4.3	100	3.0	4.2	3.1
08	280	7.7	200	4.8	100	3.4	4.6	3.0
09	300	7.5	220	4.9	100	3.5	5.8	2.9
10	300	8.0	200	5.3			5.2	2.9
11	320	8.2	200	5.3			5.0	2.8
12	320	8.3	200	5.4			5.3	2.8
13	305	8.2	200	5.5	100		5.4	2.9
14	320	8.0	220	5.2	100		4.5	2.9
15	300	8.0	210	5.2	100	3.5	4.5	2.9
16	300	8.1	210	5.0	100	3.3	4.2	3.0
17	280	8.0	220		100	2.8	3.8	3.0
18	270	8.0	230		100	(2.3)	4.0	3.0
19	260	8.1					4.1	2.9
20	270	7.7					3.2	2.8
21	280	7.8					4.4	2.8
22	275	7.5					3.5	2.7
23	270	7.3					3.0	2.7

Time: 135.0°E.
Sweep: 1.0 Mc to 17.0 Mc, manual operation.

Table 27

Fukaura, Japan (40.6°N, 139.9°E) August 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	300	7.6					4.0	2.6
01	300	7.4					3.4	2.6
02	300	7.1					3.2	2.7
03	300	6.8					2.7	2.6
04	300	6.6				E	2.8	2.6
05	290	7.0				1.6	3.0	2.8
06	295	7.2					4.0	2.9
07	275	8.3					4.6	3.0
08	275	8.5	230				4.9	2.9
09	290	8.6	220	6.0			5.0	3.0
10	300	8.9	220				5.0	2.9
11	320	9.0	230	5.4			5.2	2.8
12	310	9.3	220	5.3			5.0	2.8
13	316	9.3	230	5.4			5.7	2.8
14	315	9.0	220	6.3			5.0	2.8
15	300	8.8	245				5.8	2.9
16	300	8.8	225		110	3.2	5.0	2.9
17	290	8.6	250		110	2.8	4.4	2.9
18	280	8.5					4.7	3.0
19	275	8.1					4.0	2.9
20	280	8.0					3.8	2.7
21	300	7.8					4.0	2.6
22	300	7.7					4.2	2.6
23	300	7.8					3.6	2.6

Time: 135.0°E.
Sweep: 1.0 Mc to 17.0 Mc, manual operation.

Table 28

Lanchow, China (36.1°N, 103.8°E) August 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	400	8.5					3.8	2.3
01	400	8.0					4.2	2.2
02	390	8.0					3.8	2.3
03	390	7.6					4.0	2.3
04	390	7.2					3.8	2.3
05	385	7.0					3.5	2.3
06	360	7.6					3.8	2.3
07	360	9.3	300		160	3.0	4.0	2.5
08	370	9.8	300		140	3.4	4.6	2.6
09	365	10.1	305				4.9	2.6
10	400	10.5	305	6.1			4.9	2.3
11	400	10.5	300	6.2			5.1	2.3
12	440	11.1	310	6.5			5.2	2.3
13	440	10.6	310	6.0			5.0	2.3
14	420	11.7	310	8.2			5.0	2.3
15	410	11.5	300	6.1			4.8	2.3
16	390	11.5	300	5.2	145	3.6	4.4	2.4
17	380	11.0	300		150	3.2	4.4	2.4
18	360	10.5	320	5.3	150	3.0	4.3	2.4
19	360	10.0					4.1	2.4
20	(380)	(9.4)					(5.8)	(2.4)
21	(400)	(8.3)						(2.2)
22	390	8.4					4.4	2.3
23	395	8.4					4.2	2.3

Time: 105.0°E.
Sweep: 2.4 Mc to 16.0 Mc in 15 minutes, manual operation.

Table 29

Tokyo, Japan (35.7°N, 139.5°E) August 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	310	7.9					3.7	2.7
01	295	7.6					3.7	2.7
02	290	7.4					3.0	2.8
03	290	6.9					2.8	2.7
04	295	6.6				E	2.4	2.7
05	300	6.7			100	1.8	2.6	2.8
06	270	8.2	240		110	2.4	3.2	3.0
07	270	9.2	230		100	3.0	4.6	3.0
08	280	9.4	230	5.0	100	3.4	5.0	3.0
09	305	9.6	210	5.2	100	3.6	5.2	2.9
10	310	9.9	220		100		5.3	2.9
11	310	10.2	225	5.4	100		5.6	2.8
12	320	10.8	226		100		5.6	2.9
13	335	10.3	225	5.6	100		4.8	2.8
14	330	10.1	240	6.3	100		4.9	2.9
15	330	9.5	240		100		4.8	2.9
16	310	9.1	230		100	3.4	5.0	2.9
17	300	9.1	250		100	3.0	4.2	2.9
18	280	9.2	260		100	2.3	3.7	3.0
19	270	8.7	260				4.5	3.0
20	265	7.5					4.2	2.8
21	320	7.2					3.9	2.7
22	310	8.1					3.9	2.7
23	310	7.7					3.4	2.8

Time: 135.0°E.
Sweep: 1.0 Mc to 17.0 Mc in 15 minutes, manual operation.

Table 30

Nanking, China (32.1°N, 119.0°E) August 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00								
01								
02								
03								
04								
05	260	6.4					2.7	2.8
06	250	7.8	240				3.0	2.8
07	260	9.1	235				3.8	3.0
08	280	9.2	240		120	3.3	4.6	2.8
09	290	9.5	240	5.5	120	4.0	4.8	2.7
10	320	9.8	230	6.0	110	4.0	5.6	2.6
11	340	10.5	225	6.0	120	4.2	5.7	2.5
12	365	11.1	230	5.8	120	4.1	5.0	2.5
13	360	12.0	220	5.9	115	4.4	4.0	2.6
14	360	11.5	240	5.8	115	4.2	4.9	2.6
15	345	11.7	240	5.6	120	4.0	4.2	2.6
16	320	11.6	240	5.6	120	4.0	4.4	2.6
17	300	10.5	240	4.6			4.6	2.6
18	300	10.3	240				4.2	2.7
19	265	9.6	240				4.0	2.8
20	265	8.5					4.0	2.5
21	280	9.1					3.0	2.5
22								
23								

Time: 120.0°E.
Sweep: 1.7 Mc to 15.0 Mc in 15 minutes, manual operation.

Table 31

Yamakawa, Japan (31.2°N, 130.6°E) August 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	300	8.5					4.2	2.7
01	300	8.3					3.6	2.7
02	290	8.3					3.2	2.8
03	290	7.7					3.2	2.8
04	290	7.3					3.0	2.8
05	300	6.8	255				3.3	2.7
06	280	7.4	250			1.9	3.0	2.8
07	260	9.1	230		110	2.6	3.6	3.0
08	260	9.3	220	4.4	110	3.2	4.4	3.1
09	260	9.4	220	5.0	110	3.5	4.6	3.0
10	300	9.5	220	6.4	110	3.8	5.4	2.8
11	300	10.0	220	5.6	110		5.4	2.7
12	325	10.6	220	6.7	110		6.6	2.7
13	340	11.4	240	5.8			6.7	2.8
14	325	11.4	220	5.6	110		6.6	2.8
15	316	11.0	240	6.4	110	3.8	5.2	2.8
16	300	11.1	230	5.2	110	3.6	4.7	2.8
17	300	10.6	230	4.8	110	3.2	4.9	2.9
18	280	10.6	240		110	2.4	4.2	3.0
19	270	10.0					3.7	3.0
20	270	8.6					4.0	2.8
21	300	8.0					4.0	2.6
22	310	8.6					3.8	2.6
23	300	8.8					3.6	2.7

Time: 135.0°E.
Sweep: 0.6 Mc to 18.5 Mc in 15 minutes, manual operation.

Table 32

Rarotonga I. (21.3°S, 159.8°W) August 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00								
01								
02								
03								
04								
05								
06	315	3.7					2.7	2.6
07	250	7.6				2.1	3.2	3.0
08	250	10.7			110	2.8	3.5	3.1
09	250	12.7	240	5.4	110	3.3	4.1	3.0
10	280	13.5	240	5.7	110	3.5	4.3	3.1
11	280	12.4	230	5.6	110	3.7	4.7	3.0
12	300	11.5	235	6.2	110	3.8	4.6	2.9
13	300	11.6	250	5.5	110	3.7	4.9	2.9
14	300	11.4	235	5.7	110	3.6	4.6	2.7
15	300	11.2	240	6.0	110	3.4	4.5	2.7
16	300	11.3	240	5.6	110	3.1	4.2	2.8
17	265	10.8	250	5.8	110	2.8	3.9	2.8
18	266	11.0				1.8	3.2	2.8
19								
20								
21								
22								
23								

Time: 167.5°W.
Sweep: 2.0 Mc to 16.0 Mc, manual operation.

Table 33

Canberra, Australia (35.3°S, 149.0°E) August 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	260	5.2					3.0	2.7
01	260	5.0					2.7	2.8
02	260	4.8					2.6	2.7
03	250	4.7					2.6	2.8
04	250	4.2					2.8	2.8
05	250	4.0					2.9	2.8
06	250	3.9						2.9
07	240	6.5			135	2.0	3.3	3.1
08	230	8.6			100	2.7	3.5	3.2
09	228	10.0			100	3.2	3.5	3.1
10	220	10.4			100	3.5	3.4	3.1
11	220	10.9	205	4.8	100	3.6	3.6	3.0
12	240	10.6	205	4.7	100	3.6	3.5	3.0
13	250	10.5	200	4.8	100	3.6	3.7	2.9
14	240	10.5	200	4.4	100	3.5	3.4	3.0
15	220	10.0	205	4.2	100	3.2	3.5	3.0
16	225	9.4			100	2.7	3.5	2.9
17	240	9.2			120	2.2	3.4	3.0
18	225	8.4					2.9	3.0
19	225	7.5					2.3	2.9
20	240	6.8						2.9
21	240	6.0					2.5	2.8
22	250	5.5					2.9	2.8
23	260	5.5					2.6	2.7

Time: 150.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 1 minute 55 seconds.

Table 34

Hobart, Tasmania (42.8°S, 147.4°E) August 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	260	4.9					3.2	2.6
01	260	4.4					2.8	(2.7)
02	260	4.0					3.0	2.7
03	265	3.8					3.0	2.7
04	250	3.8					2.6	2.7
05	250	3.5					3.0	2.7
06	250	3.2					2.2	2.8
07	250	4.7				(1.9)	2.4	3.1
08	230	7.5			120	2.3	2.3	3.4
09	240	8.4	230	3.9	118	2.9	3.0	3.3
10	250	9.0	220	(4.0)	112	3.2	2.6	3.2
11	250	9.4	220	4.1	110	3.4	2.2	3.2
12	258	(10.0)	215	4.4	110	3.5	3.0	(3.2)
13	250	10.2	215	4.5	110	3.4	3.2	3.1
14	250	10.0	215	(4.0)	110	3.3	3.0	3.0
15	240	9.6	215	(3.9)	110	3.0	3.1	3.1
16	230	9.4	222	(3.2)	110	2.6	2.5	3.1
17	230	9.3			120	2.0	2.1	3.2
18	230	8.5					2.0	3.2
19	230	7.2					2.0	(3.3)
20	230	6.0					2.0	3.0
21	240	5.4						2.9
22	248	5.3					2.0	2.8
23	250	5.0					2.4	2.8

Time: 150.0°E.
Sweep: 1.0 Mc to 13.0 Mc in 1 minute 55 seconds.

Table 35

Christchurch, New Zealand (43.5°S, 172.7°E) August 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	280	5.0					2.7	2.7
01	280	4.9					2.7	2.7
02	290	4.8					2.7	2.8
03	280	4.1					2.6	2.9
04	270	3.8					2.7	2.9
05	270	3.3					2.7	2.7
06	280	3.3					2.6	2.9
07	250	5.4				(1.4)	2.7	3.1
08	240	7.8				2.3	2.6	3.2
09	240	8.8	240	4.0		2.8		3.1
10	250	9.6	230	4.5		3.2	4.0	3.1
11	260	9.8	230	4.7		3.3	3.8	3.0
12	270	10.4	240	4.8		3.4	4.0	3.0
13	260	10.2	230	4.7		3.4	4.0	2.9
14	255	10.0	230	4.7		3.2		3.0
15	240	9.6	235	4.2		2.8		2.9
16	250	9.1				2.4	2.6	2.9
17	240	8.7				1.7	2.6	3.0
18	240	7.8					2.6	2.8
19	250	7.1					2.7	2.7
20	260	6.4					2.6	2.8
21	265	6.0					2.6	2.8
22	280	5.3					2.5	2.7
23	280	5.2					2.8	2.6

Time: 172.5°E.
Sweep: 1.0 Mc to 13.0 Mc.

Table 36

Rarotonga I. (21.3°S, 159.8°W) July 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00								
01								
02								
03								
04								
05								
06	300	3.8					2.9	2.6
07	260	7.4					2.9	3.0
08	250	10.6			110	2.7	3.4	3.1
09	250	12.4			110	3.2	3.9	3.2
10	245	12.6	220		110	3.5	4.4	3.1
11	250	11.6	235	6.4	105	3.7	4.5	3.1
12	250	10.6	240	6.3	105	3.7	4.8	3.0
13	300	10.4	240	6.4	105	3.7	4.7	2.8
14	300	11.0	250	6.0	105	3.6	4.4	2.7
15	330	11.0	250	6.0	105	3.5	4.1	2.7
16	290	11.2	250	5.4	105	3.2	3.9	2.8
17	280	11.6	255	5.5	115	2.6	3.5	2.8
18	250	11.4	250			(1.9)	3.5	2.9
19								
20								
21								
22								
23								

Time: 157.5°W.
Sweep: 2.0 Mc to 16.0 Mc, manuel operation.

Table 37

Bagneux, France (48.8°N, 2.3°E) April 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00								
01								
02								
03								
04								
05								
06	270	6.6						3.0
07	250	8.2	230					3.0
08	275	9.0	230					2.9
09	300	9.0	220				4.3	2.8
10	320	10.0	210				4.2	2.7
11	310	10.3	210				4.2	2.7
12	340	10.2	210				4.1	2.7
13	320	10.4	230				4.1	2.7
14	320	9.8	230				4.1	2.7
15	340	9.7	235				4.1	2.8
16	310	9.5	240					2.8
17	260	9.5	260					2.9
18	260	9.6	250					2.8
19	260	8.8	260					2.8
20	285	(8.4)						(2.8)
21	300	8.4						(2.7)
22	315	(8.0)						(2.6)
23								

Time: 0.0°.
Sweep: 3.9 Mc to 6.8 Mc and 7.8 Mc to 13.5 Mc in 12 minutes.

Table 38

Bagneux, France (48.8°N, 2.3°E) March 1948

Time	h'F2	f°F2*	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00								
01								
02								
03								
04								
05								
06	280	5.7						3.0
07	260	7.5						(3.2)
08	250	9.0						(3.1)
09	250	9.9	230					3.0
10	270	10.7	230					3.0
11	260	10.9	225					(3.0)
12	260	10.8	220					2.9
13	250	10.6	235					(3.0)
14	250	10.6	220					(3.0)
15	240	10.6						3.2
16	250	10.5						(3.0)
17	250	10.6						3.1
18	240	9.1						(3.0)
19	240	8.0						(3.0)
20	280	(7.7)						
21	310	6.0						(2.8)
22	340	5.7						3.0
23								

Time: 0.0°.
Sweep: 3.9 Mc to 6.8 Mc and 7.8 Mc to 13.5 Mc in 12 minutes.
*Medians in this column were obtained from observed values of $f^{o}F2$ and values derived from $f^{x}F2$.

TABLE 39

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

h'F2 (Characteristic), Km (Unit), November (Month), 1948

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: E.J.W., J.J.S., J.M.C.

Calculated by: A.G.J., K.L.B., J.J.S.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	250 F	250 F	250 F	260 F	230	230	(250) F	230	210 F	230	240	250	250	240	240	230	220	220	240	230 K	240 K	270 K	300 K	250 K
2	230 K	260 K	[240] A K	(230) F K	310 F K	260 F S	280 F K	280 K	290 K	370 F K	400 K	450 K	450 F K	450 K	420 K	330 K	250 K	250 K	250 K	250 K	240 K	A K	A	250 F
3	260 F	250 F	250	[260] A	(280) S	(330) S	(300) S	240	230	230	230	250	250	250	250	250	230	220	210	210	230	250	250	250
4	240	230	(250) F S	250	270	270	250 F	230	230	230	230	240	230	230	230	250	220	200	200	220	220	250	250	240
5	250	250 F	(240) S	250 F	260	260	(270) S	240	220 F	240	230	240	250	250	240	230	230	210	(210) S	210	230	250	260	260
6	260	250	250	240	(230) S	250	260	230	220	240	250	240	250	250	250	230	230	210	200	(210) S	230	250	260	260
7	250	250	250	250	250	(250) S	250	230	220	230	250	240	250	250	260	240	220	220	210	210	210	250	(260) S	260
8	260	250	(240) S	230	250	260 F	270	240	230	[230] A S	230	230	240	250	250	240	240	230	220	230	220	240	240	240
9	240	250	270	260	260	240	250	240	230	230	230	230	240	230	230	230	230	220	210	210	(230) S	240	250	240
10	250	250	250	250	240	250	260	240	220	220	C	C	250	240	250	240	220	210	210	240	230	250	250	240
11	240	230	230	240	240	260 S	250	230	220	220	220	240	240	240	230	230	230	210	210	210	230	250	240	230
12	250	240	250	250	240	230	250	230	220	230	230	230	250	230	220	230	230	220	200	220	210	240	240	230
13	250	250	250	250	240	240	240	230	230	230	230	220	230	230	240	220	230	220	210	220	220	230	230	210
14	230	250	250	250	250	250	250	220	220	210	210	240	250	(220) A	250	220	220	210	210	210	(250) A	[250] A	250	250
15	250	250	250	250	260	(230) A	240	220	220	230	220	220	250	250	250	230	230	230	210	(200) A	220	230	230	250
16	240	260	(260) A	(260) A	(250) A	230	230	230	230	210	230	230	240	230	230	230	230	200	230	230	(210) S	230	240	250
17	270	270	300	280	250	260	270	270	240	240	240	230	250	240	C	C	240	230	230	230	220	230	240	250
18	270	320	300	300	280	270	320	250	230	230	240	250	230	250	230	230	230	220	230	210	220	210	230	260
19	300	300	300	280	260	260	(300) A	250	220	210	230	(200) C	230	230	230	230	230	220	210	210	230	250	240	260
20	290	300	300	(310) S	300	290	280	280	250	230	250	230	250	250	230	230	230	230	230	230 K	290 K K	(330) F S	330 K F	280 K F
21	K 310 S F K	300 F S K	(270) F S K	(250) F S	250 K	(230) F K	240 K	250 K	240 K	230	240	240	220	220	230	230	220	(210) A	(230) A	240	240	250	240	250
22	240	240	230	250	260	310	300	250	230	230	230	260	210	230	240	230	220	200	220	210	240	250	280	300
23	280	270	270	250	250	250	250	250	230	230	(230) A	230	140	230	230	230	230	210	210	220	210	240	240	240
24	250	290	270	250	250	250	290	250	210	230	230	230	230	240	230	230	220	210	200	220	220	220	210	230
25	260	280	270	250	250	240	(300) S	250	220	230	230	230	230	230	230	220	220	220	(210) S	230	220	200	(210) S	230
26	230	250	250	250	250	(250) A	[270] A	280	230	230	230	230	230	230	(230) A	(230) A	230	200	210	200	230	220	250	260
27	250	270	260	280	270	240	250	240	230	230	230	230	230	230	230	220	220	210	210	220	250	230	230	250
28	250	270	280	240	230	250	280	250	230	230	230	230	230	250	230	230	230	200	200	220	220	230	270	260
29	270	300	280	260	230	230	230	230	230	230	230	230	210	230	240	230	220	230	200	(230) A	(220) A	210	260	(250) C
30	260	(250) S	280	260	250	240	230	230	230	(230) C	230	[220] C	220	230	240	(230) C	230	200	200	210	210	200	250	250
31																								
Median	260	250	250	250	250	250	255	240	230	230	230	230	240	235	230	230	230	220	210	220	225	240	250	250
Count	30	30	30	30	30	30	30	30	30	30	29	29	30	30	29	29	30	30	30	30	30	29	29	30

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U.S. GOVERNMENT PRINTING OFFICE 1946 O - 702519

TABLE 40

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

f°F2 (Characteristic), Mc (Unit), November (Month), 1948

Observed at Washington, D.C.

Lat 39.0°N, Long. 77.5°W — 75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: E. J. W., J. J. S., J. M. C.

Calculated by: K. L. B., A. G. J., J. J. S.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	3.7	[3.4]	3.5	3.9	(3.7)	2.8	2.7	6.3	8.2	9.4	(9.7)	11.6	11.6	11.6	11.7	(11.5)	(9.9)	(10.9)	(9.5)	8.7	(7.7)	7.3	(7.3)	7.7
2	(7.0)	5.0	[3.2]	[3.4]	3.1	(2.7)	3.3	5.3	(5.8)	5.7	5.7	5.5	5.4	5.7	5.8	6.3	(6.1)	6.3	6.1	(5.8)	4.8	[3.8]	3.1	4.2
3	(4.1)	(3.9)	3.2	3.0	2.1	2.1	2.7	6.7	(10.0)	(10.0)	10.8	11 8	12.2	12.0	12.0	(12.1)	(12.4)	(11.8)	(10.0)	8.5	6.8	5.6	4 9	4.7
4	(4.3)	(4.1)	(3.1)	(2.7)	(2.7)	2.9	F	6.3	9.0	(10.8)	11.5	(11.8)	(11.3)	10.6	10.6	11.0	(9.8)	9.3	8.0	7.1	(6.2)	5.6	5 5	(5.1)
5	(4.7)	F	F	(3.6)	3.3	3.3	3.1	(6.3)	(8.7)	10.5	10.6	11 4	11.8	11.8	(11.3)	(10.2)	(10.1)	(9.7)	(9.4)	(6.9)	(5.7)	(5.1)	(5.0)	(4.9)
6	(4.8)	(4.6)	[4.7]	[4.3]	(3.8)	3.1	[3.5]	6.2	(9.2)	10.4	11.7	11.6	11.7	(11.9)	11.9	(11.5)	[11.0]	(9.4)	8 6	(7.3)	6.4	5.3	(5.4)	(5.3)
7	5.3	(4.9)	(4.5)	4.2	(4.1)	3.9	(4.1)	6.7	8 8	10.0	11.5	12.4	(12.6)	12.4	11.7	(12.2)	(11.6)	(10.7)	(9.6)	(8.5)	6.7	(5.9)	(5.9)	5.7
8	(5.7)	(6.2)	(5.8)	(5.3)	(4.3)	(4.1)	4.3	(7.0)	(10.0)	(10.8)	10.8	12.0	12.2	12.3	12.3	12.3	(11.8)	(10.8)	(9.0)	8.8	(7.5)	7.0	(6.8)	6.4
9	5.8	5.4	5.1	5.2	5.1	4.9	4.8	7.0	(9.8)	(12.0)	(12.4)	12.6	(13 0)	13.0	12.5	12.5	(11.7)	(11.2)	(9.5)	8 7	(7.5)	7.0	6.5	6.0
10	5.8	5.8	5.5	5.5	5.3	4.9	4.9	7 3	9.8	11.5	[11.9]	[12.4]	(13.9)	12.6	(11.8)	11.5	(11.5)	(9.7)	(9.1)	8.5	6.7	6.7	6.5	(6.3)
11	(5.9)	(5.7)	4.5	4.2	(3.9)	3.7	3.7	6.8	9.2	10.4	11.6	12.0	12.5	12.3	12.4	(12.0)	(11.8)	(11.0)	(9.3)	(8.0)	6.8	(6.5)	6.4	5.6
12	(5.3)	(5.1)	5.0	(5.1)	5.0	4.3	(3.9)	6.8	(9 5)	11.3	11.8	11.8	12.6	12.7	12.6	12.2	(11.8)	(10.0)	(9.3)	8.0	7.0	6.9	(6.0)	5.4
13	4.8	4.5	4.7	4.7	4.4	4.3	3.9	(6.6)	(9.6)	11.4	(11.7)	12.5	12.6	12.4	12 6	11.6	(11.4)	(98)	9 5	9.2	(7.8)	(7.6)	7.1	5.7
14	4.9	4.9	5.0	4.9	4.8	4.5	4.5	(7.2)	(10.8)	11.7	13.0	12.4	(13.0)	(12.7)	12.5	12.2	10.7	(9.8)	9.6	8.6	(7.5)	6.9	6.9	(5.9)
15	5.7	(5.1)	(5.3)	5.0	(4.7)	(4.5)	4.7	7.0	(9.8)	(11.5)	(12.4)	12.8	13.0	(12.9)	12.8	(12.2)	(11.7)	12.0	(10.8)	9.3	8.5	8.1	6.9	6.5
16	6.4	(6.1)	(5.1)	[5.0]	(5.2)	(5.7)	(5.6)	(7.5)	10.7	(12.0)	12.8	13.0	(13.7)	(12.8)	(12.5)	(12.5)	12.6	(11.3)	(9.8)	(9.3)	8.6	7.6	6.5	6.6
17	6.3	(6.5)	(5.9)	(6.2)	(4.1)	(5.3)	(5.0)	(6.5)	8.6	9 8	10.7	11.4	11.8	(12.3)	C	C	(12.0)	S	S	(9.7)	8.8	6.9	(6.5)	(5.4)
18	4.9	(4.3)	(2.8)	(2.9)	(3.1)	[4.0]	[3.9]	(5.9)	9.2	(11.4)	12.4	12.7	13.5	13.7	(13.5)	12.9	(11.9)	(11.5)	(11.0)	9.0	(7.9)	(6.9)	(5.8)	(5.3)
19	(4.9)	(5.1)	5.4	(5.1)	(4.2)	[4.2]	[4.3]	(5.2)	(9.2)	(10 9)	(12.0)	(11.0)	12.8	[12.6]	12.4	(12.0)	(11.8)	(11.2)	9 2	8.4	(7.1)	6.5	(5.7)	4.9
20	4.7	4.7	(4.3)	(2.5)	(2.5)	(2.6)	3.1	5.3	8 5	(10.0)	11.2	11 8	12.4	12.5	13.0	[12.8]	12.6	(11.7)	(11.7)	(9.3)	5.9	(2.6)	2.3	(2.2)
21	(2.1)	(2.3)	(2.3)	(2.5)	[2.3]	[2 1]	3.0	(5.7)	8.7	11.3	12.6	13.5	12.6	(12.6)	12.5	(11.8)	(11.6)	(10.3)	(9.3)	8.9	7.7	(6.8)	(6.3)	(6.0)
22	(5.7)	(5.4)	(4.3)	4.0	3.5	(2.7)	2.8	6.9	(9.7)	(10.0)	11.8	13.0	12.8	12.8	(13.1)	12.5	(12.2)	(10.5)	(9.6)	8.7	7.0	(6.5)	(5.8)	5.2
23	(3.7)	(3.3)	(3.5)	(4.5)	4.3	4.2	4.3	6.0	8.9	10.8	11.3	12.5	12.7	12.4	12.1	11.5	11.6	(9.7)	9.2	8 7	(6.9)	5.9	5.2	4.9
24	4.1	(4.3)	(4.1)	(4.1)	(3.1)	(2.6)	(2.5)	(5.0)	8.5	9.8	10.3	12.4	12.0	12.3	(12.0)	12.7	12 4	(10.3)	(9.4)	8.7	(7.9)	7.1	6.0	5.4
25	(4.6)	(4.3)	4.6	4.6	4.2	(2.7)	(2.4)	5.0	7.9	10.0	(10.0)	12.2	12.3	12.7	(13.0)	11.9	(11.3)	[9.7]	(9.4)	(9.3)	7.8	6 5	5.1	4.8
26	(4.1)	(3.9)	(4.0)	(3.6)	(2.7)	(2.1)	2.2	4.5	8.2	9.1	11.5	11.9	12.3	12.0	11.9	11.6	(11.3)	(10.5)	(9.3)	7.5	(6.8)	5.1	(4.3)	(3.9)
27	3.5	3.7	3.7	3.5	3.5	3.5	3.4	5.6	8.4	9.4	11.2	11.4	12.0	12.4	(12.0)	(11.6)	(10.6)	(9.3)	8.6	(7.3)	(6.1)	5.7	4.5	4.1
28	3.8	4.2	4.3	(4.1)	3.6	2.7	2.5	4.7	7.6	9.6	10.5	11.1	11.2	12.4	11.7	(11.8)	11.8	9.6	8.0	7.0	5.4	(4.1)	3.7	3.6
29	3.4	3.6	3.7	4.3	(4.4)	(3.9)	(3.7)	(4.8)	8.4	(9.6)	(9.8)	11.7	11.5	11.6	11.7	11.3	10.8	(9.5)	(7.9)	7.2	6.6	4.7	(3.9)	(4.1)
30	[4.0]	(3.9)	[4.1]	(4.3)	4.2	4.1	3.9	5.2	8.6	(9.5)	(10.2)	[10.8]	11.5	11.4	(11.2)	(11.2)	(10.5)	(9.3)	8.5	6.9	6.5	4.8	4.1	4.1
31																								
Median	4.8	(4.6)	(4.3)	(4.2)	(4.0)	3.8	3.7	6.3	9.0	10.4	11.5	12.0	12.4	12.4	12.1	11.9	(11.6)	(10.3)	(9.3)	8.6	7.0	6.5	5.8	5.3
Count	30	29	29	30	30	30	29	30	30	30	30	30	30	30	29	29	30	29	29	30	30	30	30	30

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U S GOVERNMENT PRINTING OFFICE 1948 O - 702519

TABLE 41

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

f°F2 (Characteristic), Mc (Unit), November (Month) 1948

Observed at Washington, D.C.

Lat. 39.0°N, Long 77.5°W

National Bureau of Standards (Institution)

Scaled by: E.J.W., J.J.S., J.M.C.

75°W Mean Time

Calculated by: A.G.J., K.L.B., J.J.S.

Day	0030	0130	0230	0330	0430	0530	0630	0730	0830	0930	1030	1130	1230	1330	1430	1530	1630	1730	1830	1930	2030	2130	2230	2330
1	(3.7)F,S	(3.9)F,S	3.6 F	3.9 F	3.3 F	2.7 F	4.1 F	(7.2) S	9.3	(9.7)S,D	10.7	11.6	11.5	11.3	11.2	(11.5)S	(10.6)S	[9.8]F,C	(9.0)F,C	8.2 K	K(7.5)F,S	7.6 K	(7.5)F,S	K(7.6)F,S
2	K(5.7)F,S	K[4.6]F,S	3.4 F,K	(3.2)F,K	3.0 F,K	2.7 F,K	4.1 F,K	K(5.8)F,S	5.8 K	5.8 K	(5.2)F	5.5 F,S	5.7 F,K	5.7 F,K	6.3 K	K(6.5)F,S	6.1 K	6.3 K	S,K(6.1)F,S	5.6 K	[4.4]A,K	[3.2]A,K	4.3 F	3.9 F
3	S(4.0)F	3.7 F	3.1 F	2.3 F	2.1 F	2.2 F	4.7	(8.8) S	(10.0) S	(10.0)S,D	11.5	12.0	12.3	(11.9) S	12.3	(12.4) S	(11.9)S,C	[10.0]S,C	(9.0)F,C	(7.6)F,S	(6.0) S	5.3	4.7	4.5
4	3.7 F	3.7 F	(3.0)F	(2.5)F	(2.7)F	(2.7)F	(4.5)F,S	(7.8) S	(10.4)S,D	11.0	11.3	(11.7)S	11.4	10.5	10.8	(10.7)S	9.6	(8.7)S	(7.5)S	(6.8)S	5.7	5.6	5.6 F,S	(4.9)F,S
5	S	F S	(3.8)F,S	[3.5]F,S	[3.3]F	(3.1)F	(4.3)F,S	(7.7)F,S	(9.3)S,D	(10.3)S	11.0	11.8	11.8	(11.3)S	(10.4)S,D	(10.2)S,D	(9.7)S,C	(9.0)S,C	7.6	(6.5)S	(5.5)F,S	(5.1)F,S	(4.9)F,S	(4.7)F,S
6	(4.8)F,S	(4.3)F,S	(4.5)F,S	[4.1]F,S	[3.4]F,S	(2.9)F	[4.6]F	(8.3) S	(9.4)S	10.6	12.0	11.6	(11.9)S	11.6	(11.7)S	11.4	[10.3]S,C	(9.2)S	7.4	(6.6)F,S	5.6	(5.5)S	5.2	(5.0)F,S
7	(5.3)S	4.8 F	4.5 F	4.1 F	3.9 F	3.8 F	4.7 F	7.6	9.5	10.6	11.8	12.6	12.5	11.8	(11.9)S,D	(11.7)S	[11.1]S,C	[10.1]S,C	9.2	7.5	F(6.2)F,S	(5.9)S	(5.7)F,S	S(5.6)F,S
8	S(5.9)F,S	(6.0)F,S	(5.6)F,S	(4.8)F,S	(4.1)F,S	4.1 F,S	5.0 F	(8.8) S	(10.3)S,D	10.9	10.8	12.4	12.4	12.0	(11.8)S	(11.8)S	(10.2)D	[9.5]S	8.8	(8.0)F	(7.4)F	6.8	6.6	6.1
9	5.5	5.2	5.2	5.0	5.0	4.8	5.2 F	8.6	11.6	(12.2)D	(12.3)D	(13.0)D	12.8	12.8	(12.0)F,D	(12.0)S,D	[10.6]S,C	(9.3)S,C	P(9.0)F,C	(8.2)F,S	7.0	6.9	6.4	(5.9)S
10	5.8	(5.5)F,S	5.5	(5.5)S	4.9	4.8	5.7	(8.9)S	(9.7)D	11.7	[12.2]C	(12.7)S,D	13.0	(12.0)S	(11.8)S	(11.6)S,D	[10.6]S,C	(9.6)F,S	(8.6)S,D	7.4	6.8	(6.5)S	6.3	(6.3)F,S
11	(5.8)S	5.4	4.3 F	(4.0)F,S	3.7 F	3.7 F	(4.9)S	8.6	(9.8)S,D	11.8	11.9	12.2	12.4	12.0	12.2	(11.7)S,D	[10.7]S,C	P(9.7)S,C	8.6	7.4	(6.5)F,S	6.4	(6.0)F,S	(5.6)S
12	(5.4)S	5.0	(5.0)S	(5.1)S	4.9	3.9 F	5.1 F	8.5	10.7	11.8	11.9	12.5	12.5	12.6	12.2	12.3	11.5	P(9.6)F,C	8.7	(7.7)F,S	7.2	6.5	5.8	5.0
13	4.6	4.5	4.7	4.8	4.3	(4.0)F,S	4.8	8.3	11.8	11.7	12.6	12.2	(12.1)S	(12.7)S	12.3	[11.5]S,C	[10.7]S,C	P(10.0)S,C	9.2	8.7	(7.7)F,S	(6.9)F,S	6.6	5.3
14	4.9	4.9	4.9	4.9	4.5	4.5	5.4	9.1	(11.2)S,D	12.6	12.6	12.6	13.0	(12.4)S,D	12.4	(11.4)S,D	(9.7)S,C	(9.7)S,C	P(9.3)F,C	(8.5)S	7.0	6.8	6.6	5.7
15	5.5	(5.0)F,S	(5.1)F	(4.7)F	4.5 F	(4.5)F	4.9 F	8.8	(11.3)S	P(11.6)F,C	13.2	(13.3)S,D	12.8	(13.5)D	(12.0)S,D	(11.4)F,D	[11.8]S,C	11.5	(10.4)S,D	9.2	9.8	7.7 F	6.7	(6.7)F,S
16	6.1	S(6.3)F,S	(5.6)F,S	(5.3)F	[5.6]F	(5.9)S	(6.0)S	8.9	12.6	12.6	13.1	(13.6)S,D	13.0	(12.7)S,D	P(13.0)F,C	P(12.6)F,C	P(11.3)S,C	P(10.0)F,C	P(9.5)F,C	9.3	8.2	7.1	6.5	6.3
17	(6.3)S	6.1	(6.3)F,S	(6.0)F,S	(5.6)F,S	S(5.3)F,S	(5.5)F	7.3	9.2	10.6	11.0	11.8	(12.0)C	C	C	(12.4)S	(11.8)S	S C	S C	(9.0)D,F	(7.9)S	(7.1)S	(6.4)S	5.1
18	(4.5)F	[3.5]F	(2.6)F	(3.0)F,S	(3.9)F	[4.0]F	(4.0)F,S	(7.7) S	10.3	11.0	12.3	13.5	(13.4)S,C	(13.2)C	P(12.7)S,C	(12.5)S,C	(11.7)S,C	C	S C	8.7	(7.6)F,C	C(6.5)F,S	[5.8]F,C	(5.2)S
19	(4.9)S	(5.3)S	(5.1)S,D	(4.2)F,S	[4.2]F,C	(4.2)F,C	[4.7]F,C	C(8.6)F,S	(10.5)S,C	12.6	S(13.0)C,F	[13.0]	13.0	(12.6)C	(12.7)S,C	(12.5)S,C	(11.9)C	[10.4]F,C	P(9.0)F,C	(7.4)F,S	6.5	(6.5)F,S	(5.2)F	4.9
20	4.7 F	(4.7)F,C	(3.1)F	(2.5)F	(2.5)F	(2.7)F	(3.6)F,S	6.5	9.2	10.5	11.5	11.8	13.0	12.7	P(13.2)S,C	(11.8)F,C	(11.7)F,C	(11.7)F,C	C(10.6)F,S	S C,K	(3.3)F,K	2.5 F,K	2.5 F,K	[2.3]F,K
21	(2.1)F,K	(2.3)F,K	(2.3)F,K	(2.3)F,K	[2.5]F,K	(2.8)F,K	[4.2]F,K	C(4.4)F,S	K(10.6)F,C	P(11.0)F,C	P(13.2)F,C	13.2	(12.9)S	12.6	11.8	P(11.8)F,C	[10.2]F,C	9.5	8.8	(7.9)F,S	6.8	(6.7)S	(6.1)F,S	(5.5)F,S
22	(5.7)S	(4.8) F	4.3	3.7	3.1 F	2.7 F	4.7 F	8.7	P(10.2)F,C	(10.7)S	12.4	(13.0)F,C	13.0	13.1	P(12.3)F,C	[12.4]C	11.5	P(9.8)F,C	P(9.6)F,C	7.6	(6.9)S	C(6.3)F,S	(5.4)C	(4.5)F
23	[4.0]F,S	(3.5)F	(4.0)F	(4.4)F,S	4.2	4.3	4.6	7.9	9.0	11.5	12.3	12.6	12.4	(12.0)D	11.8	11.6	P(10.2)F,C	P(9.6)F,C	8.9	8.2	6.1	5.3	5.0	4.3 F
24	(3.9)S	(4.1)F,S	(4.2)F,S	(3.5)F	(2.7)F	(2.5)F	(3.1)F	7.5	9.2	10.8	11.5	12.3	(12.4)C	(12.3)C	P(12.4)F,C	12.4	[10.5]F,C	(9.4)F,C	(9.3)F,C	8.8	(7.8)F,S	(7.5)F,S	(5.8)F,S	4.8
25	(4.3)F,S	(4.5)S	4.6	4.3	3.7	(2.4)F	(2.7)F	7.1	8.9	(10.6)F,C	11.5	12.0	12.5	(13.6)S	(12.4)F,C	11.6	[10.5]F,C	P(9.4)F,C	P(9.5)F,C	8.6	(7.4)S	5.7	5.2	(4.6)F
26	(3.7)F	(4.5)F,S	(3.7)F	3.4 F	(2.3)F	(2.1)S	2.7 F	(5.9)F,S	7.9	10.3	11.8	11.8	11.8	12.2	11.6	(11.6)F,C	[10.9]F,C	[9.9]F,C	8.9	6.8	5.8	(4.5)S	(4.0)F,S	(3.9)S
27	(3.5)F	(3.7)F	(3.6)F	3.5 F	3.5 F	3.5 F	(3.3)F,S	6.6	8.8	9.8	11.9	12.0	12.3	12.7	12.0	P(10.5)F,C	P(10.3)F,C	9.0	7.9	(5.7)F,S	(6.2)F	5.2	4.3	4.1
28	4.0 F	(4.0)S	4.2	(4.0)S	3.2	2.5 F	2.9 F	(6.1)F	(8.8)2	7.4	10.3	11.3	12.2	11.9	P(12.0)F,C	[11.4]F,C	P(10.0)F,C	(9.3)F,C	(7.4)S	(6.1)F,S	4.7	3.6	(3.7)F,S	(3.6)F,S
29	3.6 F	3.7 F	(3.9)F,S	(4.8)F,S	F(4.2)F,S	(3.9)F	3.8 F	6.7	8.6	[9.7]C	(11.2)C	(11.7)C	11.5	11.6	11.6	11.3	(9.5)C	9.0	7.6	(7.2)S	(5.9)S	(4.1)F,S	(4.0)F,S	(3.9)F,S
30	[3.9]C,S	C(3.9)F,S	(4.9)F	(4.3)F,S	(4.2)S	4.0	3.9	6.7	9.2	9.9	10.8	C	C	11.5	(11.2)F,S	(10.9)F,C	P(9.8)F,C	(9.3)F,C	7.6	6.9	5.9	(7.5)F,S	(4.2)F,S	(4.0)F,S
31																								
Median	(4.7)	(4.5)	(4.3)	(4.1)	3.8	(3.8)	4.6	7.8	9.6	10.8	11.8	12.2	12.4	12.2	(12.0)	(11.6)	(10.6)	(9.6)	(8.9)	7.6	(6.6)	6.4	5.6	(5.0)
Count	29	29	30	30	30	30	30	30	30	30	30	29	29	29	29	30	30	28	28	29	30	30	30	30

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U.S. GOVERNMENT PRINTING OFFICE 1946 O - 703518

TABLE 42

Central Radio Propogation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

h'F1 (Characteristic), Km (Unit), November (Month), 1948

Observed at Washington, D.C.

Lat. 39.0°N, Long. 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: E.J.W., J.J.S., J.M.C.

Calculated by: J.J.S., K.L.B., A.G.J.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									Q	(220)A	200	200	230	210	210	Q	Q	Q						
2									260K	250K	240K	250K	250K	240K	230K	230K	QK	QK						
3									Q	210	200	(220)S	200	220	230	230	Q	Q						
4									Q	220	210	(210)S	210	220	Q	220	Q	Q						
5									Q	210	200	200	210	210	220	220	Q	Q						
6									Q	210	200	230	200	200	210	Q	Q	Q						
7									Q	Q	200	210	220	200	220	220	Q	Q						
8									Q	A	200	200	220	230	230	230	Q	A						
9									Q	Q	210	200	210	220	220	220	Q	Q						
10									Q	Q	C	C	210	220	220	220	Q	Q						
11									Q	Q	Q	210	230	Q	220	220	Q	Q						
12									Q	210	Q	210	210	Q	Q	220	Q	Q						
13									Q	210	210	Q	Q	Q	220	Q	Q	Q						
14									Q	Q	Q	200	210	Q	210	Q	Q	Q						
15									Q	210	210	Q	210	210	230	Q	Q	Q						
16									Q	Q	200	210	210H	(210)C	220	Q	Q	Q						
17									Q	210	220	210	200	230	C	C	Q	Q						
18									Q	Q	200	220	Q	220	Q	Q	Q	Q						
19									Q	Q	210	Q	Q	210	220	Q	Q	Q						
20									Q	Q	200	210	230	230	Q	Q	Q	Q						
21									QK	Q	200	220	Q	Q	Q	Q	Q	Q						
22									Q	Q	Q	200	Q	Q	230	Q	Q	Q						
23									Q	Q	Q	Q	(230)A	210	Q	Q	Q	Q						
24									Q	Q	220	200	210	210	220	220	Q	Q						
25									Q	210	200	Q	220	Q	220	Q	Q	Q						
26									Q	Q	200H	200	200	Q	Q	Q	Q	Q						
27									Q	Q	200	200	200	220	220	210	Q	Q						
28									Q	210	200	210	210	200	220	200	Q	Q						
29									Q	210	200	230	Q	220	220	Q	Q	Q						
30									Q	Q	220	C	200	200	230	Q	Q	Q						
31																								
Median										210	200	210	210	215	220	220								
Count										13	24	23	24	22	22	13								

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U.S. GOVERNMENT PRINTING OFFICE: 1946 O - 703516

TABLE 43

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

f°F1 (Characteristic) — Mc (Unit) — November (Month), 1948

Observed at Washington, D.C.

Lat. 39.0°N, Long 77.5°W — 75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: E.J.W., J.J.S., J.M.C.

Calculated by: J.J.S., K.L.B., A.G.J.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1									Q	L	L	L	L	L	L	Q	Q	Q							
2									L K	(4.0) S K	4.3 K	(4.1) S K	4.4 K	(4.3) S K	4.3 K	L K	Q K	Q K							
3									Q	L	L S	(L) S	L	L	L	L	Q	Q							
4									Q	L	L	L S	L	L	Q	L	Q	Q							
5									Q	L S	L	L	L	L	L	L	Q	Q							
6									Q	L	L	L	L S	L	L	Q	Q	Q							
7									Q	Q	L	L	L S	L	L	L	Q	Q							
8									Q	A	L	L	L	L	L	L	Q	A							
9									Q	Q	L	L	L	L	L	L	Q	Q							
10									Q	Q	C	C	L	L	L	L	Q	Q							
11									Q	Q	Q	L	L	Q	L	L	Q	Q							
12									Q	L	Q	L	L	Q	Q	L	Q	Q							
13									Q	L	L	Q	Q	Q	L	Q	Q	Q							
14									Q	Q	Q	L	L	Q	L	Q	Q	Q							
15									Q	L	L	Q	L	L A	L	Q	Q	Q							
16									Q	Q	L	L	L	L	L	Q	Q	Q							
17									Q	L	L	L	L	L	C	C	Q	Q							
18									Q	Q	L	L	Q	L	Q	Q	Q	Q							
19									Q	Q	L	Q S	Q	L	L	Q	Q	Q							
20									Q	Q	L	L S	L	L	Q	Q	Q	Q							
21									Q K	Q	L	L	Q	Q	Q	Q	Q	Q							
22									Q	Q	Q	L	Q	Q	L	Q	Q	Q							
23									Q	Q	Q	Q	L A	L	Q	Q	Q	Q							
24									Q	Q	L S	L S	L	L	L	L	Q	Q							
25									Q	L	L	Q	L	Q	L	Q	Q	Q							
26									Q	Q	L N	L	L	Q	Q	Q	Q	Q							
27									Q	Q	L	L	L	L	L	L	Q	Q							
28									Q	L N	L	L	L	L	L	L	Q	Q							
29									Q	L N	L	L	Q	L	L	Q	Q	Q							
30									Q	Q	L	C	L N	L	L	Q	Q	Q							
31																									
Median																									
Count																									

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U S GOVERNMENT PRINTING OFFICE 1948 O - 703510

TABLE 44

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

h'E (Characteristic), Km (Unit), November (Month), 1948

Observed at Washington, D. C.

Lat. 39.0°N, Long. 77.5°W — 75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: E.J.W., J.J.S., J.M.C.

Calculated by: A.G.J., K.L.B., J.J.S.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									100	A	100	100	(110)^{A}	(110)^{A}	100	100	100							
2								100^{K}	100^{K}	100^{K}	100^{K}	100^{K}	100^{K}	100^{K}	100^{K}	100^{K}	100^{K}	120^{K}						
3								110	100	A	(100)^{A}	100	100	(110)^{S}	(110)^{S}	110	110	120						
4								A	100	100	A	(100)^{A}	100	110	110	(100)^{S}	(100)^{S}							
5								(100)^{S}	A	100	100	100	100	100	100	100	(110)^{A}							
6								(160)^{S}	100	100	100	(100)^{A}	100	100	100	100	110							
7								170	(110)^{A}	100	110	100	(100)^{A}	100	100	100	100							
8								160	A^{S}	100	100	100	100	100	100	110	120	A						
9								C	110	100	110	100	110	100	100	(110)^{A}	(110)^{A}							
10								A	100	100	C	C	110	(110)^{A}	110	100	100	A						
11								A	100	100	100	(100)^{A}	(100)^{A}	100	100	100	110							
12								A	A	100	100	100	100	100	100	(100)^{A}	(100)^{A}							
13								110	100	(100)^{A}	100	100	(110)^{B}	100	(110)^{A}	(100)^{A}	110							
14								100	A	A	(110)^{A}	100	(110)^{A}	A	(110)^{A}	110	110							
15								A	A	(110)^{A}	A	(110)^{A}	(110)^{A}	A	(110)^{A}	100	110							
16								100	A	(110)^{A}	100	100	(100)^{A}	A	A	100	(130)^{A}	A						
17								100	100	A	110	110	100	110	C	C	120	A						
18									110	100	100	110	120	110	110	110	100							
19								A	(100)^{A}	A	(110)^{A}	(110)^{A}	(100)^{A}	100	110	(100)^{A}	120							
20								S	(110)^{A}	(100)^{A}	100	100	100	100	100	100	110	C						
21									(100)$^{C}_{K}$	100	100	100	100	100	(100)^{A}	100	A							
22								120	110	100	100	(100)^{A}	(100)^{A}	110	100	100	110							
23								A	(130)^{A}	(100)^{A}	A	(130)$^{A}_{C}$	A	A	(110)^{A}	110	110							
24									110	100	(110)^{A}	(110)^{A}	100	110	(100)^{C}	100	110							
25								A	(110)^{A}	(100)^{A}	(100)^{A}	100	100	110	100	110	(110)^{C}							
26								A	A	(100)^{A}	(100)^{A}	100	110	100	(100)^{A}	110	(120)^{S}							
27									100	100	100	100	100	110	110	110	110							
28									100	100	100	100	(100)^{A}	(100)^{A}	110	110	120							
29									110	(110)^{A}	100	(110)^{A}	100	(110)^{A}	110	A	(120)^{A}							
30									110	(100)^{C}	(120)^{A}	C	120	120	120	(120)^{C}	110							
31																								
Median								110	100	100	100	100	100	100	100	100	110							
Count								11	23	25	26	28	29	26	28	28	29							

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U. S. GOVERNMENT PRINTING OFFICE 1948 O - 728518

TABLE 45

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.

Form adopted June 1946

IONOSPHERIC DATA

f°E (Characteristic), Mc (Unit), November (Month), 1948

Observed at Washington, D. C.

Lat 39.0°N, Long 77.5°W — 75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: E.J.W., J.J.S., J.M.C.

Calculated by: A.G.J., K.L.B., J.J.S.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									S	A	(3.1)^{A}	3.4^{F}	3.5	3.3	3.2	2.9	(2.4)$^{S}_{E}$							
2								2.0^{K}	2.3^{K}	[2.7]$^{S}_{K}$	3.0$^{H}_{K}$	3.2^{K}	3.3^{K}	3.3^{K}	3.2^{K}	2.9^{K}	[2.4]$^{S}_{K}$	1.7^{K}						
3								(2.1)^{S}	[2.5]^{A}	2.9^{H}	(3.1)$^{S}_{F}$	3.3	3.4	3.4	3.2	S^{e}	S^{e}	(1.9)^{C}						
4								A	A^{s}	A^{s}	(3.1)$^{A}_{S}$	3.3^{F}	3.5^{F}	3.4	3.3	3.0	(2.4)^{S}							
5								(2.0)^{S}	(2.5)^{S}	2.9^{F}	3.2	3.4	3.5	3.5	(3.3)^{S}	(3.0)$^{S}_{E}$	S^{e}							
6								1.9^{F}	(2.5)^{S}	[2.9]^{A}	3.3	3.4	3.5	3.4	(3.2)^{S}	2.9	2.5							
7								2.0	(2.5)^{S}	2.9	3.1	(3.3)$^{S}_{E}$	(3.5)^{S}	3.4^{H}	3.2^{H}	2.9	(2.3)^{S}							
8								2.0	(2.6)$^{H}_{S}$	(2.8)^{A}	[3.0]^{A}	3.3	[3.4]^{A}	3.6	3.3	3.0	2.2	A						
9								1.9	2.4	3.0	3.1	3.3	3.4	3.3	3.2	2.9	(2.3)^{A}							
10								A	(2.5)^{S}	3.0	C	C	3.6	3.5^{H}	A	A	A	A						
11								A	(2.5)^{H}	(3.0)^{A}	3.2	3.4	[3.4]^{A}	3.4	3.2	2.8	2.3							
12								A	2.5	3.0	3.3	3.5	3.5	3.5	3.3	2.9	2.4							
13								(1.9)^{C}	(2.4)^{H}	3.1	3.1	3.5	(3.8)^{B}	3.5	3.3	2.9	(2.0)$^{S}_{E}$							
14								(2.0)^{F}	2.5	3.1	3.5	3.5	(3.6)^{C}	[3.4]^{A}	3.3	3.0	(2.4)$^{S}_{E}$							
15								A	(2.5)^{C}	3.0	(3.3)^{A}	(3.5)^{C}	3.6	(3.5)^{A}	3.3	2.9	2.3							
16								1.9^{H}	[2.4]^{A}	3.0^{H}	(3.2)^{S}	3.4	3.5	[3.4]^{A}	(3.3)^{C}	(2.9)^{S}	(2.3)$^{H}_{S}$	A						
17								2.0	(2.3)^{H}	(2.8)$^{A}_{S}$	(3.2)^{S}	3.4	3.4	(3.3)^{S}	C	C	2.2^{H}	A						
18									2.5	3.0^{H}	(3.1)^{H}	3.3^{H}	3.4	3.5	(3.6)^{S}	(2.9)$^{S}_{E}$	(2.5)^{H}							
19								(2.0)^{H}	2.4	(2.5)^{A}	3.1^{H}	3.3	(3.4)^{C}	(3.4)$^{S}_{E}$	3.3	3.1	(2.4)^{C}							
20								1.9	2.4	3.0	3.1	3.3	(3.4)^{C}	3.3^{H}	3.2	2.8	2.6	(1.9)^{C}						
21									(2.1)$^{H}_{K}$	2.7	3.2	3.4	3.4	3.3^{H}	[3.0]^{A}	(2.7)^{A}	A							
22								1.9	2.6	(2.9)$^{S}_{E}$	3.2	3.2	3.3	3.4	3.1	2.6	(2.2)^{C}							
23								A	2.3^{H}	2.7	(3.1)^{A}	3.1	[3.1]^{A}	3.1	3.0	2.7	2.2							
24									2.2	2.8	(3.0)^{H}	3.2	3.2	3.4	(3.0)^{C}	2.6	(2.6)^{C}							
25								(1.9)$^{A}_{E}$	2.4^{H}	(2.8)^{C}	3.1	[3.2]^{C}	3.3	3.3	3.1	2.5	2.1^{H}							
26								A	A	2.7	2.9	3.1	3.2	3.1	(2.9)^{A}	A	2.0^{H}							
27									2.3^{H}	2.7	3.0^{H}	3.1	3.3	3.1^{H}	2.9	2.5^{H}	2.1							
28									(2.2)^{H}	2.7^{H}	3.1^{H}	3.3^{H}	(3.3)^{C}	[3.1]^{A}	2.9	(2.6)^{H}	2.1							
29									(2.1)^{H}	2.7^{H}	3.1^{H}	3.2	3.1	3.1	(2.9)^{A}	[2.5]^{A}	2.1							
30									2.3^{H}	(2.6)^{C}	2.9^{H}	[3.0]^{C}	3.1	3.2	3.0	(2.7)^{C}	(2.3)^{E}							
31																								
Median								2.0	(2.4)	2.9	3.1	3.3	3.4	3.4	3.2	2.9	2.3							
Count								15	27	28	29	29	30	30	28	26	26	3						

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U. S. GOVERNMENT PRINTING OFFICE 1948 O - 762519

TABLE 46

Central Radio Propogation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

Es (Characteristic), Mc-Km (Unit), November (Month), 1948

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: E.J.W., J.J.S., J.M.C.

Calculated by: J.J.S., K.L.B., A.G.J.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										5.4/100	3.9/100		2.7/90	3.0/100				1.9/90						
2			3.9/120	2.0/130	1.5/120						3.0/100										3.8/100	5.7/100	4.4/100	2.8/140
3	3.2/120	3.9/120	3.6/120	3.4/100	1.9/100				3.6/100	2.8/100	3.6/100						3.8/90	2.1/90	2.0/90	2.0/90	1.9/100	1.9/100		2.0/100
4				1.9/100	1.8/110			2.1/100	3.1/100	3.1/100	3.5/100	2.9/100					3.2/90	3.9/90				2.0/100		
5									2.8/100	3.5/100	3.1/100						3.6/90	3.2/90	3.2/100					
6										3.9/100		2.3/100									3.2/110			
7								5.6/100	5.6/100			4.4/110	3.4/100						3.0/120					
8		2.5/130	2.0/130						2.9/100	7.4/100	3.6/110	4.5/110	5.6/100				2.7/130	4.3/110	2.6/110					
9								1.9/110	3.1/110	2.9/90						3.1/100	3.3/100	2.9/100	3.1/100					
10								1.9/110	3.1/110	2.9/90	C	C	2.0/100	2.0/100	3.5/110	3.2/100	2.9/100	3.0/100			2.0/90			
11								5.6/100	3.1/110	3.8/110		3.0/100	3.5/110	2.0/90		3.1/90		1.9/100	1.9/100	3.2/100	3.2/100			
12				2.9/100		2.2/100		2.7/110	3.1/100			2.9/100	3.0/90			1.9/100	3.2/100	3.2/100	5.6/110					3.0/100
13	3.1/100		3.1/90		1.9/100		3.0/100			3.9/100					3.1/90	2.4/90	1.9/100		2.9/90		3.2/100	2.0/100		
14				5.8/110					3.3/90	3.9/100	3.7/100	12.5/100	4.2/90	5.6/90	3.1/100	1.9/100		1.9/110		3.2/100	6.1/100	7.6/100	5.5/100	
15	3.3/100	5.7/100	1.9/100			3.3/110	2.9/100	3.4/100	2.9/100	3.7/100	5.7/100	5.2/100	5.7/100	5.0/90	4.1/90			1.8/100	2.0/100	3.1/100	1.9/100	3.3/100	3.5/100	1.9/100
16			4.9/90	3.6/100	3.8/100	3.9/100	1.9/100		3.9/100	4.0/100			3.3/100	4.8/90	4.2/90		3.2/100	3.5/100	3.8/90	1.9/100	3.0/100		3.9/100	1.9/100
17	3.9/100			1.9/110	1.9/100									1.8/90	C	C	2.6/130	1.9/120		1.9/120		3.6/100		
18								1.8/110					3.7/130				2.8/130	1.8/130			1.9/100			
19						2.7/100	3.7/100	2.1/100	4.5/110	4.2/100	3.9/100	3.1/100	3.1/100		2.9/100	5.7/110		2.1/100						
20						4.7/120		3.8/100	1.9/100	2.0/100														
21											6.5/100				3.3/100	2.9/110	6.1/100	4.1/100	4.1/100	3.1/100	3.0/100	1.9/100		
22			1.5/100		2.0/120							3.1/100	3.1/100						1.9/110	2.9/100				
23							2.7/100	3.5/100	2.2/100	3.0/100	5.3/100	3.9/100	5.6/100	4.0/100	3.0/100	1.9/90	3.8/90	2.9/90	2.9/90			1.9/100		3.2/100
24	3.2/100			2.8/100	2.3/100	2.9/100					3.0/100	3.0/100				3.1/110	2.0/90			1.9(150)C	5.4/100	3.1/100		
25						3.1/110		2.0/100	2.3/110	2.9/100	3.1/100										3.1/100	3.2/100	1.9/100	
26	1.9/110		1.7/100			4.3/100	5.4/100	8.4/100	5.0/100	2.1/100	2.0/100	3.0/130	3.1/100	4.2/120	5.5/100	5.4/100	3.0/90		1.9/100	3.4/100	3.5/100	3.1/100		3.0/100
27	3.1/100	3.0/100	3.0/100		1.5/100	2.9/100	2.9/100	3.0/110	3.1/100			2.9/90	3.0/100		1.8/100	1.9/100								
28				3.0/100	1.9/100	1.9/100				5.6/100	3.2/100		3.1/100	3.5/100	3.2/100	3.0/100	3.6/90						3.3/100	3.1/100
29	3.0/100	3.1/100	3.2/100	3.0/100	2.9/100					3.0/100		2.1/100		3.0/100	3.8/100	3.4/100	3.2/100	5.5/100	3.2/100	3.0/100	3.1/100			
30		2.1/100			3.0/120						3.5/100	C	2.8/100	3.6/120	3.3/140				3.5/100					
31																								
Median	**	**	**	**	**	**	**	**	2.6	2.9	3.0	2.2	2.8	**	**	**	2.3	1.9	1.9	**	**	**	**	**
Count	30	30	30	30	30	30	30	30	30	30	29	28	30	30	29	29	30	30	30	29	30	30	30	30

** MEDIAN fEs LESS THAN MEDIAN f°E OR LESS THAN LOWER FREQUENCY LIMIT OF RECORDER.

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U S GOVERNMENT PRINTING OFFICE 1948 O - 703519

TABLE 47

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

F2-M1500 (Characteristic), ____ (Unit), November (Month), 1948

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

National Bureau of Standards (Institution)

Scaled by: E.J.W., J.J.S., J.M.C.

75°W Mean Time

Calculated by: K.L.B., J.J.S., A.G.J.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	(2.1) S F	[2.0] S F	1.9 F	2.0 F	(2.0) F	2.1 F	2.0 F	2.4	2.3	2.2	(2.3) S P	2.1	2.1	2.1	2.0	(2.1) S	(2.4) S	(2.1) S	(2.2) S C	2.0 K	J (1.9) S K	1.8 K	(1.8) S K	1.9 K
2	(2.0) K	1.9 F K	F K	F K	1.7 F K	(1.7) F K	1.8 F K	2.0 F K	F (1.9) S K	(1.9) F K	1.8 F K	1.7 F K	1.7 F K	1.7 F K	1.7 K	2.0 K	(2.0) S K	2.0 K	1.9 F K	J F (1.9) S K	1.8 F K	A K	1.7 F	1.8 S F
3	J (2.0) S F	J (2.1) S F	2.0 F	(2.0) F Z	2.1 F	1.9 F	1.9 F	2.1	(2.4) S P	(2.3) S	2.2	2.1	2.1	2.1	2.1	(2.1) S	(2.2) S	(2.1) S	(2.3) S C	2.1	2.1	1.9	2.0	1.9
4	(2.1) J S	(2.1) S Z	(2.1) F	(2.0) F	(2.0) F	1.8 F	F	2.2	2.2	S (2.2) C P	2.4	(2.3) S	(2.2) S	2.1	2.1	2.1	(2.3) S	2.3	2.1	2.1	(2.1) S	2.0 F	(2.0) F S	(2.1) F S
5	(2.1) S F	F S	F S	(1.8) S F	1.9 F	(2.0) S F	1.9 F	J (2.2) S F	(2.3) S	2.3	2.2	2.2	2.1	2.1	(2.2) S	(2.3) S	(2.3) J S	(2.2) S C	(2.1) S	(2.0) S	(2.1) S	(2.1) S F	(2.1) J S	(1.9) S
6	(1.9) J S	(2.0) F	F S	F S	(2.2) S F	1.9 F	F	2.2	(2.4) S	2.4	2.2	2.1	2.1	(2.1) S	2.1	(2.1) S	S C	(2.2) S	2.0	(2.0) S	2.0	2.0	(1.9) F S	(1.9) S
7	2.0	(2.0) F	(2.0) F S	1.9 F	(1.9) F S	1.9 F	(2.0) F S	2.2	2.3	2.2	2.1	2.0	(2.1) S	2.0	2.1	(2.0) S	(2.0) S	(2.1) S P	(2.1) S P C	(2.1) S	2.0	J (1.9) F	(1.9) F S	1.9
8	(1.9) F S	(1.9) F S	(2.0) F S	J (2.1) F S	J (2.0) F S	(1.8) F S	2.0 F	(2.2) F S	(2.5) S P	(2.2) J S	2.2	2.1	2.0	2.0	2.0	2.0	(2.0) S	(2.1) J S	(2.2) S	1.9	(2.0) J	2.0	(1.9) J	2.0
9	2.1	1.9	1.9	1.8 F	1.9	1.9	2.1	2.1	(2.2) P	(2.3) P	(2.1) F	2.1	(2.0) J	2.0	2.1	2.1	(2.1) S	(2.1) S C	(2.1) C P	2.0	(2.0) S	2.0	2.2	2.0
10	1.9	1.9	1.8	1.9	1.9	1.8	1.9	2.2	2.3	2.2	C	C	(1.9) S P	2.0	(2.1) S	2.2	(2.1) S	(2.2) S P	(2.1) S P	2.1	1.9	1.9	2.0	(2.0) J S
11	(2.1) S	(2.1) S	2.1 F	1.9 F	(2.0) F S	1.9 F	2.1 F	2.2	2.3	2.2	2.2	2.2	2.1	2.0	1.9	(2.1) S	(2.1) S P	(2.1) S P	(2.1) S	(2.0) J S	2.0	(2.0) J S	2.0	2.0
12	(2.0) S	(2.0) S	2.0	(2.0) S	2.0	2.0 F	(2.0) F S	2.2	(2.4) S P	2.2	2.2	2.1	2.1	2.1	2.1	2.1	(2.1) S	S (2.3) C P	(2.0) C P	2.1	2.1	2.1	(2.1) J S	2.0
13	1.9	1.9	1.9	2.0	2.1	1.9	2.1	(2.2) S	(2.3) S P	2.3	(2.1) S	2.1	2.0	2.0	2.1	2.2	(2.2) S C	S (2.2) C P	2.0	2.0	(2.1) J S	(2.1) J S	2.2	2.1
14	2.0	1.9	2.0	2.0	2.0	1.8	2.0	(2.2) J S	S (2.3) C P	2.3	2.3	2.2	(2.1) C P	(2.0) S P	2.0	2.1	2.2	(2.3) S P	2.2	2.1	(2.1) S	2.0	2.1	(2.2) J S
15	2.1	(2.0) J F	(1.9) F S	2.0 F	(1.7) F	(2.0) F	2.1 F	2.2	S (2.4) S P	(2.3) S	S (2.1) C P	2.1	2.1	(2.1) P	2.1	(2.1) S P	(2.1) S P	2.0	(2.1) S P	2.1	2.0 F	2.0	2.0	1.9
16	1.9	(1.8) J	(1.8) F	F S	(1.8) F S	(2.0) J	(2.1) S	(2.2) S	2.2	(2.4) S P	2.1	2.1	(2.0) J	(2.0) C P	(2.0) C P	(2.0) S	2.0	S (2.1) C P	S (2.1) C P	S (2.2) C P	2.1	2.1	1.9	1.9
17	1.8	(1.8) S	(1.7) F S	(1.7) F S	(1.9) J S	(1.8) F S	(1.8) F	(2.0) F S	2.1	2.1	2.0	2.0	1.9	(1.9) S	C	C	(1.9) S P	S C	S C	(2.2) P C	2.0	1.9	(2.0) J	(2.0) S
18	1.9	(1.6) J F	(1.5) F	(1.6) F	(1.8) J F	F	F	(2.1) J	2.2	(2.2) P	2.1	2.0	2.0	2.1	(2.0) J C	2.0	(2.1) J	(2.0) S C	J (1.9) S C	2.1	(2.2) S C	(2.1) S C	(2.0) S C	J (2.0) S C
19	(1.9) J S	J (1.7) F S	1.9	J (1.8) S C	(1.7) S C	F C	F C	J (2.0) F C	J (2.2) S C	(2.3) S C	(2.1) C	(2.1) C	2.1	S C	2.2	(2.1) S C	(2.0) C	(2.1) S C	2.1	2.1	(2.0) S	2.1	(2.1) J S	2.0
20	1.8 F	1.7 F	(1.7) F S	(1.8) F	(1.8) F	(1.9) F	1.7 F	1.9 F	2.0	(2.2) S C	2.1	2.0	2.0	1.9	1.9	S C	2.1	(2.0) S C	J (2.2) S C	S (1.9) C K	1.8 K	(1.8) F K	1.9 F K	(1.8) F S
21	(2.0) F K	(1.9) F K	(1.8) F K	(1.9) F K	F K	F K	1.9 F K	S 2.0 C K	2.1 K	2.6	2.2	2.2	2.2	S (2.1) C P	2.1	(2.1) S P	(2.1) S P	S (2.1) C P	(2.0) S	2.1	2.2	(2.0) S	(2.0) S	J (2.2) S C
22	(2.1) S C	(2.0) S F	(2.0) F	1.9	1.8 V	(1.8) F	1.7 F	2.3	(2.3) S P	J (2.5) S C	2.1	2.1	2.2	2.0	(2.1) S P	2.2	(2.2) S C	J (2.1) S C	S (2.2) C F	2.1	1.9	(2.0) S	(1.8) Z	1.7
23	(1.9) F	(2.0) F	(1.9) F	(1.8) J S	1.9	1.8	2.0	2.2	2.4	2.3	2.2	2.2	2.3	2.1	2.2	2.3	2.2	S (2.2) F	2.0	2.1	(2.2) S	2.1	2.0	2.1
24	1.9 F	(1.9) F	(2.0) F S	(2.1) S	(1.9) F	(2.1) F	(2.0) F	(2.1) F S	2.4	2.4	2.3	2.2	2.1	2.1	S (2.2) C P	2.2	2.1	(2.3) S C	S (2.1) C	2.1	(2.1) S	2.0	2.3	2.0
25	(1.9) S F	(1.8) S	1.9	1.9	1.9	(2.3) F	(1.9) F	2.2	2.8	2.4	S (2.3) C	2.3	2.1	2.0	(2.2) S	2.2	(2.1) S	S C	S (2.1) C P	(2.2) S	2.2	2.0	2.2 F	2.2
26	J (2.3) S F	(2.0) F	(2.0) F S	(2.0) F	(1.9) F	(2.3) F	2.2 F	2.0 F	2.3	2.3	2.2	2.1	2.2	2.2	2.2	2.2	S (2.2) C P	S (2.2) C F	S (2.4) C P	2.3	(2.3) S	2.1	(2.1) J S	(2.0) S
27	2.2 Z	1.9 F	2.0 F	1.8 F	1.9 F	2.0 F	2.2 F	2.3	2.4	2.5	2.2	2.2	2.2	2.2	(2.2) S P	(2.2) J P	S (2.2) C P	(2.3) S P	2.1	(2.5) J	(2.3) J	2.4	2.2	2.1
28	2.0	1.9	1.9	(2.1) S	2.1 F	2.1 F	1.8 F	2.1 F	2.4	2.4	2.1	2.1	2.1	2.2	2.1	S (2.4) C P	2.2	2.3	2.2	2.3	2.2	(2.2) J S	2.0	2.0 F
29	2.0 F	1.9 F	1.9 F	1.9 F	(2.1) J S	(2.1) F	(2.2) F	(2.3) F S	2.4	(2.4) F	(2.4) C	2.2	2.3	2.2	2.1	2.2	2.2	(2.4) S C	(2.1) J S	2.1	2.3	2.4	(2.0) J S	J (2.1) S C
30	C S	(1.9) F S	C	(2.0) J C	2.0	2.1	2.1	2.1	2.6	(2.4) C	(2.3) C	C	C	2.2	(2.1) C	(2.0) C	(2.3) S C	(2.4) S C	2.2	2.1	2.3	2.3	2.0	2.1
31																								
Median	(2.0)	(1.9)	1.9	(1.9)	(1.9)	1.9	2.0	2.2	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	(2.1)	(2.2)	(2.1)	2.1	2.1	2.0	2.0	2.0
Count	29	29	26	27	29	27	26	30	30	30	29	28	29	29	29	28	29	28	29	30	30	29	30	30

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

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TABLE 48

Central Radio Propogation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

F2-M3000 (Characteristic), ____ (Unit), November (Month), 1948

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W — 75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: E.J.W., J.J.S., J.M.C.

Calculated by: J.J.S., K.L.B., A.G.J.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	(3.0)$^{F}_{S}$	F^{S}	2.9^{F}	2.9^{F}	(3.0)^{F}	3.2^{F}	3.0^{F}	3.4	3.4	3.3	(3.3)$^{S}_{P}$	3.1	3.0	3.0	3.0	(3.1)^{S}	(3.4)^{S}	(3.1)^{S}	(3.3)$^{S}_{C}$	3.0^{K}	^{K}(2.9)$^{J}_{S}$	2.6^{K}	(2.6)$^{S}_{K}$	2.9^{K}
2	(3.0)$^{V}_{K}$	2.8$^{F}_{K}$	F^{K}	F^{K}	2.6$^{F}_{K}$	(2.6)$^{F}_{K}$	2.5$^{F}_{K}$	3.0$^{F}_{K}$	^{K}(2.8)$^{F}_{S}$	(2.9)$^{F}_{K}$	2.8$^{F}_{K}$	2.5$^{F}_{K}$	2.6$^{F}_{K}$	2.6$^{F}_{K}$	2.6^{K}	2.9^{K}	(3.0)$^{S}_{K}$	2.9^{K}	2.8$^{F}_{K}$	$^{S}_{K}$(2.8)$^{J}_{F}$	2.7$^{F}_{K}$	A^{K}	2.6^{F}	2.7$^{F}_{S}$
3	^{S}(3.1)$^{J}_{F}$	^{S}(3.0)$^{J}_{F}$	3.1^{F}	(3.0)$^{F}_{L}$	3.1^{F}	2.9^{F}	2.7^{F}	3.1	(3.5)$^{S}_{P}$	(3.4)^{S}	3.2	3.2	3.1	3.0	3.2	(3.0)^{S}	(3.2)^{S}	(3.1)^{S}	(3.5)$^{S}_{C}$	3.1	3.0	2.9	2.9	2.9
4	(3.1)$^{J}_{S}$	(3.1)$^{S}_{L}$	(3.1)^{F}	(3.0)^{F}	(3.0)^{F}	2.8^{F}	F	3.3	3.3	^{P}(3.2)$^{S}_{C}$	3.3	(3.4)^{S}	(3.2)^{S}	3.2	3.3	3.2	(3.4)^{S}	3.3	3.1	3.2	(3.1)^{S}	3.0^{F}	(2.9)$^{F}_{S}$	(3.1)$^{F}_{S}$
5	(3.0)$^{F}_{S}$	F^{S}	F^{S}	(2.7)$^{F}_{S}$	2.9^{F}	(3.0)$^{F}_{S}$	2.9^{F}	^{S}(3.3)$^{J}_{F}$	(3.3)^{S}	3.3	3.3	3.2	3.2	3.1	(3.2)^{S}	(3.2)^{S}	(3.4)$^{J}_{S}$	(3.2)$^{S}_{C}$	(3.1)^{S}	(3.1)^{S}	(3.2)^{S}	(3.1)$^{F}_{S}$	(3.1)$^{J}_{S}$	(2.9)^{S}
6	(2.8)$^{J}_{S}$	(3.0)^{F}	F^{S}	F^{S}	(3.3)$^{F}_{S}$	2.9^{F}	F	3.2	(3.4)^{S}	3.4	3.2	3.1	3.2	(3.1)^{S}	3.1	(3.1)^{S}	S^{C}	(3.2)^{S}	3.1	(3.1)^{S}	3.0	2.9	(2.8)$^{F}_{S}$	(2.8)^{S}
7	2.9	(2.9)^{F}	(2.9)$^{F}_{S}$	2.8^{F}	(2.9)$^{F}_{S}$	2.8^{F}	(2.9)$^{F}_{S}$	3.3	3.4	3.2	3.1	3.0	(3.1)^{S}	3.0	3.1	(3.0)^{S}	(3.0)^{S}	(3.1)$^{S}_{P}$	^{P}(3.1)$^{S}_{C}$	(3.1)^{S}	3.0	^{F}(2.9)$^{J}_{S}$	(2.8)$^{F}_{S}$	2.8
8	(2.9)$^{F}_{S}$	(2.9)$^{F}_{S}$	(3.0)$^{F}_{S}$	^{S}(3.1)$^{J}_{F}$	^{S}(2.9)$^{J}_{F}$	(2.7)$^{F}_{S}$	2.9^{F}	(3.3)$^{F}_{S}$	(3.5)$^{S}_{P}$	(3.1)$^{J}_{S}$	3.2	3.0	2.9	3.1	3.0	3.0	(3.0)^{S}	(3.2)$^{J}_{S}$	(3.2)^{S}	2.8	(3.1)^{J}	3.0	(2.9)^{J}	3.0
9	3.0	2.9	2.8	2.7^{F}	3.0	2.9	3.1	3.3	(3.2)^{P}	(3.3)^{P}	(3.2)^{P}	3.1	(3.0)^{J}	3.1	3.1	3.1	(3.2)^{S}	(3.1)$^{S}_{C}$	^{P}(3.2)$^{S}_{C}$	3.0	(3.1)^{S}	3.0	2.9	3.0
10	2.9	2.9	2.7	2.9	2.8	2.8	2.9	3.3	3.5	3.2	C	C	(2.8)$^{S}_{P}$	3.0	(3.2)^{S}	3.2	(3.0)^{S}	(3.2)$^{S}_{P}$	(3.2)$^{S}_{P}$	3.2	2.8	2.9	3.0	(3.0)$^{J}_{S}$
11	(3.0)^{S}	(3.1)^{S}	3.1^{F}	2.9^{F}	(3.0)$^{F}_{S}$	2.9^{F}	3.0^{F}	3.3	3.4	3.2	3.2	3.3	3.0	3.0	2.9	(3.1)^{S}	(3.1)$^{S}_{P}$	(3.1)$^{S}_{P}$	(3.1)^{S}	(3.0)$^{J}_{S}$	2.9	(2.9)$^{J}_{S}$	3.0	3.0
12	(3.0)^{S}	(3.0)^{S}	3.0	(3.0)^{S}	3.0	2.9^{F}	(3.0)$^{F}_{S}$	3.3	(3.4)$^{S}_{P}$	3.3	3.3	3.2	3.2	3.1	3.1	3.1	(3.2)^{S}	^{P}(3.3)$^{S}_{C}$	(3.1)$^{S}_{C}$	3.2	3.1	3.1	(3.2)$^{J}_{S}$	3.0
13	2.9	2.9	2.8	3.0	3.0	2.8	3.1	(3.4)^{S}	(3.4)$^{S}_{P}$	3.3	(3.1)^{S}	3.1	3.0	2.9	3.1	3.2	(3.1)$^{S}_{C}$	^{P}(3.3)$^{S}_{C}$	3.5	3.1	(3.1)$^{J}_{S}$	(3.1)$^{J}_{S}$	3.3	3.2
14	2.9	2.9	2.9	2.9	3.0	2.8	2.9	(3.3)$^{J}_{S}$	^{P}(3.3)$^{S}_{C}$	3.4	3.2	3.2	(3.1)$^{S}_{P}$	(3.1)$^{S}_{P}$	3.0	3.1	3.3	(3.4)$^{S}_{P}$	3.2	3.1	(3.2)^{S}	3.0	3.2	(3.2)$^{J}_{S}$
15	3.1	(3.0)$^{J}_{F}$	(2.8)$^{F}_{S}$	3.0^{F}	(2.6)^{F}	(2.8)^{F}	3.2^{F}	3.3	^{P}(3.5)$^{S}_{C}$	(3.4)^{S}	^{P}(3.1)$^{S}_{C}$	3.1	3.1	(3.1)^{F}	3.1	(3.1)$^{S}_{P}$	(3.2)$^{S}_{P}$	3.0	(3.0)$^{S}_{P}$	3.1	2.9^{F}	3.0	2.9	2.8
16	2.9	(2.7)^{J}	(2.7)^{F}	F^{S}	(2.7)$^{F}_{S}$	(3.0)^{J}	(3.2)^{S}	(3.2)^{S}	3.3	(3.4)$^{C}_{P}$	3.1	3.1	(3.0)^{J}	(3.0)$^{C}_{F}$	(3.0)$^{S}_{F}$	(3.1)^{S}	3.1	^{P}(3.1)$^{S}_{C}$	^{P}(3.1)$^{S}_{C}$	^{P}(3.2)$^{S}_{C}$	3.1	3.1	2.9	2.9
17	2.7	(2.8)^{S}	(2.5)$^{F}_{S}$	(2.6)$^{F}_{S}$	(2.9)$^{J}_{S}$	(2.7)$^{F}_{S}$	(2.8)^{F}	(3.0)$^{F}_{S}$	3.2	3.1	2.9	3.0	2.9	(2.9)^{S}	C	C	(2.9)$^{S}_{P}$	S^{C}	S^{C}	(3.1)$^{F}_{C}$	3.0	3.0	(2.9)^{J}	(2.8)^{S}
18	2.9	(2.5)$^{J}_{F}$	(2.4)^{F}	(2.4)^{F}	(2.7)$^{J}_{F}$	F	F	(3.0)^{J}	3.0	(3.2)^{P}	3.1	3.0	2.9	3.0	(3.0)$^{J}_{C}$	3.0	(3.1)^{J}	(3.0)$^{S}_{C}$	^{C}(3.1)$^{J}_{S}$	3.1	(3.3)$^{S}_{C}$	(3.2)$^{S}_{C}$	(3.0)$^{S}_{C}$	^{C}(3.0)$^{J}_{S}$
19	(2.8)$^{J}_{S}$	^{S}(2.6)$^{J}_{F}$	2.8	^{C}(2.8)$^{J}_{S}$	(2.5)$^{S}_{C}$	F^{C}	F^{C}	^{C}(3.0)$^{J}_{F}$	^{C}(3.3)$^{J}_{S}$	(3.2)$^{S}_{C}$	(3.1)^{C}	(3.1)^{C}	3.0	S^{C}	3.1	(3.2)$^{S}_{C}$	(3.0)^{C}	(3.1)$^{S}_{C}$	3.1	3.2	(3.1)$^{J}_{S}$	3.0	(3.2)$^{J}_{S}$	2.9
20	2.7^{F}	2.6^{F}	(2.6)$^{F}_{S}$	(2.7)^{F}	(2.7)^{F}	(2.8)^{F}	2.6^{F}	2.8^{F}	3.0	(3.2)$^{S}_{C}$	3.1	3.0	3.0	2.9	2.9	S^{C}	3.2	(3.0)$^{S}_{C}$	^{C}(3.2)$^{J}_{S}$	^{K}(3.0)$^{F}_{C}$	2.8^{K}	(2.6)$^{F}_{K}$	2.8$^{F}_{K}$	(2.7)$^{F}_{K}$
21	(3.0)$^{F}_{K}$	(2.9)$^{F}_{K}$	(2.7)$^{F}_{K}$	(2.8)$^{F}_{K}$	F^{K}	F^{K}	2.8$^{F}_{K}$	^{K}(3.0)$^{S}_{C}$	3.2^{K}	3.4	3.2	3.1	3.2	^{P}3.2$^{S}_{C}$	3.2	(3.2)$^{S}_{P}$	(3.1)$^{S}_{P}$	^{P}(3.1)$^{S}_{C}$	(3.0)^{S}	3.1	3.2	(3.0)^{S}	(3.0)^{S}	^{S}(3.2)$^{J}_{C}$
22	(3.1)$^{J}_{C}$	(3.0)$^{F}_{S}$	(2.9)^{F}	2.8	2.7^{V}	(2.6)^{F}	2.8^{F}	3.4	(3.3)$^{S}_{P}$	^{C}(3.4)$^{J}_{S}$	3.2	3.1	3.2	3.0	(3.1)$^{S}_{P}$	3.2	(3.2)$^{S}_{P}$	^{C}(3.1)$^{J}_{S}$	^{P}(3.3)$^{S}_{C}$	3.2	2.9	(3.0)^{S}	(2.8)^{Z}	2.6
23	(2.8)^{F}	(2.9)^{F}	(2.8)^{F}	(2.7)$^{J}_{S}$	2.8	2.7	2.9	3.2	3.4	3.3	3.3	3.2	3.2	3.1	3.2	3.4	3.3	^{P}(3.3)$^{S}_{C}$	3.1	3.1	(3.3)^{S}	3.1	3.0	3.1
24	2.9^{F}	(2.8)^{F}	(3.0)$^{F}_{S}$	(3.2)$^{F}_{S}$	(2.9)^{F}	(3.1)^{F}	(3.0)^{F}	(3.2)$^{F}_{S}$	3.4	3.5	3.5	3.2	3.2	3.1	^{P}(3.2)$^{S}_{C}$	3.2	3.2	(3.3)$^{S}_{C}$	(3.2)$^{S}_{C}$	3.2	(3.1)$^{J}_{S}$	3.1	3.3	3.0
25	(2.8)$^{F}_{S}$	(2.7)^{S}	2.7	2.8	2.9	(3.1)^{F}	(2.8)^{F}	3.2	3.7	3.5	^{P}(3.4)$^{S}_{C}$	3.3	3.1	3.1	(3.2)^{S}	3.3	(3.2)^{S}	S^{C}	^{P}(3.1)$^{S}_{C}$	(3.2)^{S}	3.2	3.2	3.1^{F}	3.3
26	^{S}(3.3)$^{J}_{F}$	(3.0)^{F}	(3.0)$^{F}_{S}$	(2.9)^{F}	(3.1)^{F}	(3.3)^{F}	2.6^{F}	3.0^{F}	3.4	3.4	3.2	3.1	3.2	3.2	3.2	3.3	^{P}(3.2)$^{S}_{C}$	^{P}(3.3)$^{S}_{C}$	^{P}(3.4)$^{S}_{C}$	3.4	(3.5)^{S}	3.1	(3.1)$^{J}_{S}$	(3.0)^{S}
27	3.2^{Z}	2.8^{F}	2.9^{F}	2.8^{F}	2.9^{F}	3.0^{F}	3.1^{F}	3.2	3.5	3.5	3.3	3.2	3.2	3.2	(3.2)$^{S}_{P}$	(3.2)$^{J}_{P}$	^{P}(3.3)$^{S}_{C}$	(3.3)$^{S}_{P}$	3.2	(3.6)^{J}	(3.4)^{J}	3.4	3.3	3.0
28	2.9	2.8	2.8	(3.1)^{S}	3.2^{F}	3.0^{F}	2.7^{F}	3.1^{F}	3.5	3.4	3.2	3.2	3.1	3.2	3.1	^{P}(3.4)$^{S}_{C}$	3.2	3.4	3.2	3.4	3.2	(3.3)$^{J}_{S}$	2.9	3.0^{F}
29	2.9^{F}	2.8^{F}	2.8^{F}	2.8^{F}	(3.0)$^{J}_{S}$	(3.1)^{F}	(3.2)^{F}	(3.3)$^{F}_{S}$	3.5	(3.5)^{P}	(3.5)^{C}	3.3	3.4	3.3	3.1	3.3	3.2	(3.4)$^{S}_{C}$	(3.1)$^{J}_{S}$	3.2	3.4	3.5	(3.1)$^{J}_{S}$	^{C}(3.1)$^{J}_{S}$
30	C^{S}	(2.9)$^{F}_{S}$	C	(3.1)$^{Z}_{C}$	3.0	3.1	3.1	3.2	3.5	(3.5)^{C}	(3.3)^{C}	C	C	3.2	(3.0)^{C}	(3.1)^{C}	(3.3)$^{S}_{C}$	(3.2)$^{S}_{C}$	3.3	3.2	3.4	3.3	3.0	3.2
31																								
Median	(2.9)	(2.9)	2.8	(2.9)	(2.9)	2.9	2.9	3.2	3.4	3.3	3.2	3.1	3.1	3.1	3.1	3.2	(3.2)	(3.2)	(3.1)	3.1	3.1	3.0	3.0	3.0
Count	29	28	26	27	29	27	26	30	30	30	29	28	29	29	29	28	29	28	29	30	30	29	30	30

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U. S. GOVERNMENT PRINTING OFFICE 1946 O - 702519

TABLE 49

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

FI-M3000 (Characteristic), ____ (Unit), November (Month), 1948

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W — 75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: E.J.W., J.J.S., J.M.C.

Calculated by: J.J.S., A.G.J., K.L.B.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									Q	L	L	L	L	L	L	Q	Q	Q						
2									L^{K}	$(3.2)^{S}_{K}$	3.1^{K}	$(3.4)^{S}_{K}$	3.4^{K}	$(3.6)^{S}_{K}$	3.4^{K}	L^{K}	Q^{K}	Q^{K}						
3									Q	L	L^{S}	L^{S}	L	L	L	L	Q	Q						
4									Q	L	L	L^{S}	L	L	Q	L	Q	Q						
5									Q	L^{S}	L	L	L	L	L	L	Q	Q						
6									Q	L	L	L	L	L	L	Q	Q	Q						
7									Q	C	L	L	L^{S}	L	L	L	Q	Q						
8									Q	A	L	L	L	L	L	L	Q	A						
9									Q	Q	L	L	L	L	L	L	Q	Q						
10									Q	Q	C	C	L	L	L	L	Q	Q						
11									Q	Q	Q	L	L	Q	L	L	Q	Q						
12									Q	L	Q	L	L	Q	Q	L	Q	Q						
13									Q	L	L	Q	Q	Q	L	Q	Q	Q						
14									Q	Q	Q	L	L	Q	L	Q	Q	Q						
15									Q	L	L	Q	L	L^{A}	L	Q	Q	Q						
16									Q	Q	L	L	L	L	L	Q	Q	Q						
17									Q	L	L	L	L	L^{S}	C	C	Q	Q						
18									Q	Q	L	L	Q	L	Q	Q	Q	Q						
19									Q	Q	L	Q	Q	L	L	Q	Q	Q						
20									Q	Q	L	L^{S}	L	L	Q	2	Q	Q						
21									Q^{K}	Q	L	L	Q	Q	Q	Q	Q	Q						
22									Q	Q	Q	L	Q	Q	L	Q	Q	Q						
23									Q	Q	Q	Q	L^{A}	L	Q	Q	Q	Q						
24									Q	Q	L^{S}	L^{S}	L	L	L	L	Q	Q						
25									Q	L	L	Q	L	Q	L	Q	Q	Q						
26									Q	Q	L^{H}	L	L	Q	Q	Q	Q	Q						
27									Q	Q	L	L	L	L	L	L	Q	Q						
28									Q	L^{H}	L	L	L	L	L	L	Q	Q						
29									Q	L^{H}	L	L	Q	L	L	Q	Q	Q						
30									Q	Q	L	C	L^{H}	L	L	Q	Q	Q						
31																								
Median																								
Count																								

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U. S. GOVERNMENT PRINTING OFFICE 1946 O - 705318

TABLE 50

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

E-M1500 (Characteristic), ____ (Unit), November (Month), 1948

National Bureau of Standards (Institution)

Observed at Washington, D.C.

Scaled by: E. J. W., J. J. S., J. M. C.

Lat 39.0°N, Long 77.5°W — 75°W Mean Time

Calculated by: A. G. J., K. L. B., J. J. S.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									S	A	(3.9)^{A}	4.1^{F}	4.0	4.0	4.6	4.4	(5.3)$^{S}_{S}$							
2								4.4^{K}	4.6^{K}	(4.1)$^{S}_{K}$	4.0$^{N}_{K}$	3.9^{K}	3.9^{K}	3.9^{K}	4.1^{K}	4.0^{K}	(4.2)$^{S}_{K}$	4.2^{K}						
3								(4.5)^{S}	A	4.2^{N}	(3.3)$^{S}_{F}$	3.9	3.8	4.1	4.4	5^{C}	5^{C}	(4.3)^{C}						
4								A	A^{S}	A	(4.2)$^{A}_{S}$	4.2^{F}	4.0^{F}	4.0	4.1	4.3	(4.3)^{S}							
5								(4.0)^{S}	(4.2)^{S}	4.1^{F}	4.1	4.1	3.7	4.0	(4.2)^{S}	(4.1)$^{F}_{S}$	5^{C}							
6								3.6^{F}	(4.0)^{S}	A	3.9	4.1	4.0	4.1	(4.1)^{S}	4.1	4.2							
7								3.5	(4.0)^{S}	4.1	4.2	(4.4)$^{S}_{C}$	(4.0)^{S}	4.2^{N}	4.4^{N}	4.3	(4.3)^{C}							
8								3.9	(3.8)$^{N}_{S}$	(4.4)^{A}	A	4.2	A	4.1	4.2	4.0	4.5	A						
9								3.5	4.2	4.3	4.2	4.0	4.1	4.2	4.3	4.1	(4.3)^{A}							
10								A	(4.0)^{S}	4.0	C	C	3.9	4.1^{N}	A	A	A	A						
11								A	(4.0)^{N}	(4.2)^{A}	4.1	4.7	A	3.9	4.1	4.3	4.4							
12								A	3.9	4.0	4.1	4.0	4.2	4.3	4.2	4.3	3.9							
13								(4.3)^{C}	(4.2)^{N}	4.7	4.3	4.1	(4.0)^{B}	4.2	4.3	4.4	(4.5)$^{S}_{C}$							
14								(4.3)^{F}	4.0	4.2	4.0	4.1	(4.2)^{C}	A	4.4	4.3	(4.3)$^{S}_{C}$							
15								A	(4.0)^{C}	4.0	(4.2)^{A}	(4.2)^{C}	4.2	(4.2)^{A}	4.2	4.3	4.4							
16								4.5^{N}	A	4.0^{N}	(4.2)^{S}	4.2	4.3	A	(4.1)^{C}	(4.5)^{S}	(4.0)$^{N}_{S}$	A						
17								4.5	(4.3)^{N}	(3.9)$^{A}_{S}$	(4.0)^{S}	4.1	4.1	(4.5)^{S}	C	C	4.4^{N}	A						
18									4.0	4.0^{N}	(4.5)^{A}	4.3^{N}	4.4	4.3	(4.2)^{S}	(4.3)$^{S}_{C}$	(4.4)^{N}							
19									4.2	(4.4)^{A}	4.2^{N}	4.2	(4.1)^{C}	(4.3)$^{S}_{C}$	4.2	4.4	(4.1)^{C}							
20								3.6	3.8	3.7	4.1	4.0	(3.8)^{C}	4.0^{N}	4.0	4.1	4.2	(3.7)^{C}						
21									(3.8)$^{N}_{K}$	4.0	4.1	4.1	4.1	4.2^{N}	A	(4.4)^{A}	A							
22								4.2	4.2	(4.2)$^{S}_{C}$	4.1	4.2	4.2	4.1	4.2	4.5	(4.1)^{C}							
23								A	3.9^{N}	3.9	(4.2)^{A}	4.0	A	4.2	4.3	4.3	4.1							
24									4.3	3.9	(4.0)^{N}	4.1	4.1	4.0	(4.6)^{C}	4.5	(3.9)^{C}							
25								(4.2)$^{A}_{C}$	4.1^{N}	(3.9)^{C}	3.9	C	4.2	4.2	4.2	4.4	4.0^{N}							
26								A	A	4.1	4.1	3.9	4.1	4.1	(4.2)^{A}	A	4.0^{N}							
27									3.9^{N}	4.1	4.3^{N}	4.2	4.2	4.2^{N}	4.1	4.2^{N}	3.9							
28									(4.1)^{N}	4.1^{N}	3.9^{N}	3.6^{N}	(4.2)^{C}	A	4.1	(4.1)^{N}	4.3							
29									(4.3)^{N}	4.1^{N}	4.2^{N}	4.1	4.5	4.2	(4.3)^{A}	A	4.3							
30									3.9^{N}	(4.0)^{C}	4.1^{N}	C	C	4.3	4.3	(4.1)^{C}	(4.5)^{C}							
31																								
Median								4.2	4.0	4.1	4.1	4.1	4.1	4.2	4.2	4.3	4.2							
Count								14	25	27	28	27	26	27	27	25	26							

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U. S. GOVERNMENT PRINTING OFFICE 1948 O - 708518

Table 51

Ionospheric Storminess at Washington, D. C.

November 1948

Day	Ionospheric character* 00-12 GCT	12-24 GCT	Principal storms Beginning GCT	End GCT	Geomagnetic character** 00-12 GCT	12-24 GCT
1	2	1			1	3
2	4	7	0000	----	5	3
3	3	1	0300		3	2
4	2	2			0	0
5	2	1			1	1
6	2	2			1	1
7	2	1			3	2
8	1	1			3	3
9	2	1			3	3
10	1	1			2	1
11	1	1			2	1
12	1	1			0	0
13	1	1			0	2
14	1	1			1	1
15	1	1			2	3
16	1	1			3	2
17	3	2			3	3
18	3	1			3	3
19	3	1			4	2
20	3	1			4	4
21	4	1	0000	1400	5	3
22	1	1			4	3
23	3	1			3	2
24	2	1			3	3
25	2	1			3	3
26	1	1			2	3
27	2	2			3	2
28	2	2			3	2
29	3	2			2	1
30	2	2			1	0

*Ionosphere character figure (I-figure) for ionospheric storminess at Washington, D. C., during 12-hour period, on an abritrary scale of 0 to 9, 9 representing the greatest disturbance.

**Average for 12 hours of Cheltenham, Maryland, geomagnetic K-figures on an arbitrary scale of 0 to 9, 9 representing the greatest disturbance.

----Dashes indicate continuing storm.

Table 52

Sudden Ionosphere Disturbances Observed at Washington, D. C.

November 1948

Day	GCT Beginning	GCT End	Location of transmitters	Relative intensity at minimum*	Other phenomena
8	1748	1815	Ohio, D.C.	0.2	
13	1649	1715	Ohio, D.C., England, New Brunswick	0.0	
14	1211	1230	England	0.1	
18	1839	1910	Ohio, D.C., England, New Brunswick	0.0	Terr.mag.pulse** 1838-1900
22	1747	1810	Ohio, D.C., New Brunswick	0.1	

*Ratio of received field intensity during SID to average field intensity before and after, for station W8XAL, 6080 kilocycles, 600 kilometers distant, for all SID except the following: Station GLH, 13525 kilocycles, 5800 kilometers distant, was used for the SID on November 14.

**As observed on Cheltenham magnetogram of the United States Coast and Geodetic Survey.

Table 53

Sudden Ionosphere Disturbances Reported by Engineer-in-Chief, Cable and Wireless, Ltd., as Observed in England

1948 Day	GCT Beginning	GCT End	Receiving station	Location of transmitters
October 22	0922	0950	Brentwood	Austria, Belgian Congo, Greece, India, Iran, Kenya, Malta, Palestine, Portugal, Southern Rhodesia, Trans-Jordan, Zanzibar
November 7	0955	1015	Brentwood	Austria, Bahrein I., Belgian Congo, Greece, Palestine, Syria
14	1215	1235	Brentwood	Austria, Greece, Iran, Trans-Jordan, Turkey

Note: Observers are invited to send to the CRPL information on times of beginning and end of sudden ionosphere disturbances for publication as above. Address letters to the Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.

Table 54

Provisional Radio Propagation Quality Figures
(Including Comparisons with CRPL Warnings and CRPL Probable Disturbed Period Forecasts)
October 1948

Day	North Atlantic						North Pacific					
	Quality figure		CRPL* Warning		CRPL Forecast of probable disturbed periods	Geomagnetic K_{Ch}	Quality figure		CRPL* Warning		CRPL Forecast of probable disturbed periods	Geomagnetic K_{Ch}
	01-12 GCT	13-24 GCT	01-12 GCT	13-24 GCT		01-12 GCT / 13-24 GCT	01-12 GCT	13-24 GCT	01-12 GCT	13-24 GCT		01-12 GCT / 13-24 GCT
1	(4)	6		X		5 / 4	6	7		X		5 / 4
2	(4)	5	X	X	X	5 / 3	6	6	X	X	X	5 / 3
3	(4)	5	X		X	3 / 3	6	6	X		X	3 / 3
4	5	6				3 / 3	6	6				3 / 3
5	5	5				4 / 1	6	6				4 / 1
6	6	6				1 / 1	6	7				1 / 1
7	6	6				1 / 2	7	7				1 / 2
8	6	6				2 / 2	6	7				2 / 2
9	6	6				1 / 1	7	7				1 / 1
10	6	7				4 / 3	7	7				4 / 3
11	5	5		X		3 / 3	7	7		X		3 / 3
12	5	6	X			3 / 2	7	6	X			3 / 2
13	7	6				2 / 3	7	6				2 / 3
14	5	6				2 / 5	6	(4)				2 / 5
15	(4)	5	X	X		5 / 4	7	6	X	X		5 / 4
16	5	5	X		X	1 / 2	6	7	X		X	1 / 2
17	6	6			X	2 / 2	7	6			X	2 / 2
18	5	6	X	X	X	5 / 4	7	7	X	X	X	5 / 4
19	(3)	(4)	X	X	X	7 / 3	5	(4)	X	X	X	7 / 3
20	5	5	X	X		1 / 3	6	(4)	X	X		1 / 3
21	(4)	5	X	X		5 / 4	5	(4)	X	X		5 / 4
22	(4)	5	X	X	X	3 / 4	5	(4)	X	X	X	3 / 4
23	(4)	5	X	X	X	4 / 3	5	(4)	X	X	X	4 / 3
24	(4)	(4)	X	X		3 / 3	5	5	X	X		3 / 3
25	5	(4)	X	X		2 / 3	6	5	X	X		2 / 3
26	(4)	5	X	X		3 / 3	6	5	X	X		3 / 3
27	(4)	(4)	X	X	X	4 / 4	6	5	X	X	X	4 / 4
28	(4)	5	X		X	3 / 2	7	6	X		X	3 / 2
29	5	6			X	3 / 2	7	8			X	3 / 2
30	5	6				2 / 1	6	8				2 / 1
31	5	6				3 / 1	6	5				3 / 1
Score:												
H			12		7				5		3	
M			0		6				1		3	
G			13		14				12		17	
(S)			6		3				4		1	
S			0		1				9		7	

*Broadcast on WWV, Washington, D.C. Times of warnings recorded to nearest half day as broadcast.

Quality Figure Scale:
1 - Useless
2 - Very poor
3 - Poor
4 - Poor to fair
5 - Fair
6 - Fair to good
7 - Good
8 - Very good
9 - Excellent

Symbols:
X Warning given or probable disturbed date

H Quality 4 or worse on day or half day of warning

M Quality 4 or worse on day or half day of no warning

G Quality 5 or better on day of no warning

(S) Quality 5 on day of warning

S Quality 6 or better on day of warning

( ) Quality 4 or worse (disturbed)

Geomagnetic K_{Ch} on the standard scale of 0 to 9, 9 representing the greatest disturbance

Table 55

American and Zürich Provisional Relative Sunspot Numbers

November 1948

Date	R_A*	R_Z**	Date	R_A*	R_Z**
1	106	85	17	147	118
2	106	100	18	196	123
3	142	85	19	215	147
4	110	88	20	183	141
5	135	88	21	162	123
6	112	88	22	157	95
7	126	70	23	115	90
8	120	69	24	107	83
9	134	79	25	134	70
10	123	84	26	102	70
11	137	107	27	92	68
12	159	110	28	82	71
13	150	127	29	75	73
14	129	102	30	74	73
15	126	85			
16	140	83	Mean:	129.9	93.2

*Combination of 43 observers; see page 8.

**Dependent on observations at Zürich Observatory and its stations at Locarno and Arosa.

Table 56a*

Coronal observations at Climax, Colorado (5303A), east limb

Date GCT	Degrees north of the solar equator 90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	Degrees south of the solar equator 5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	P
1948																																					
Nov. 1.7	-	-	-	-	-	-	-	-	-	-	-	-	3	13	13	14	15	16	22	26	30	30	32	26	17	9	8	9	10	10	9	3	X	X	X	X	X	/25
5.8	-	-	-	-	3	3	3	2	2	9	10	11	11	10	16	28	33	20	18	21	23	21	20	17	15	15	12	6	4	2	-	-	-	-	-	-	-	/25
13.8	-	-	-	-	-	-	-	-	-	-	3	4	6	8	11	15	22	24	20	20	33	30	25	17	10	9	10	7	4	5	5	4	4	-	-	-	-	/20
14.7	-	-	-	-	-	3	3	3	3	3	4	4	7	8	11	22	25	25	20	17	18	16	15	12	10	5	4	3	-	-	-	-	-	-	-	-	-	/20
15.6	-	-	-	-	-	-	-	-	3	3	3	3	4	5	7	9	11	15	20	20	17	19	18	13	11	11	7	5	5	3	-	3	4	6	8	7	5	3	/20
21.7	-	-	-	-	-	-	-	-	-	-	-	-	5	8	12	14	11	10	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	/20
28.7	-	-	-	-	-	-	-	-	-	3	3	3	2	-	5	8	12	11	11	12	16	20	13	14	15	13	10	10	10	9	7	3	-	-	-	-	-	/15

*Data for November 30, 1948, will be included with the data for December 1948 in the CRPL-F53.

Table 57a*

Coronal observations at Climax, Colorado (6374A), east limb

Date GCT	Degrees north of the solar equator 90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	Degrees south of the solar equator 5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	P
1948																																					
Nov. 1.7	-	-	-	-	-	-	-	-	-	-	-	1	8	14	10	7	1	1	2	3	12	12	3	8	10	-	-	1	1	-	1	1	X	X	X	X	X	/25
5.8	-	-	-	-	-	-	-	-	-	-	-	1	3	6	8	11	14	14	12	11	12	5	7	8	2	1	1	-	-	-	-	-	-	-	-	-	-	/25
13.8	-	-	-	-	-	1	1	1	1	2	2	2	2	2	2	3	3	4	1	5	14	14	13	12	-	-	-	-	-	-	-	-	1	1	1	1	1	/20
14.7	1	1	1	1	1	1	1	1	3	3	3	2	-	-	-	9	11	7	1	1	13	14	14	10	8	2	1	1	-	-	-	-	-	-	-	-	-	/20
15.6	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	1	1	4	3	1	10	8	2	1	-	-	-	-	-	-	-	2	2	3	3	3	/20
21.7	-	-	-	-	-	-	-	-	-	-	-	-	-	9	10	11	11	10	3	6	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	2	/20
28.7	-	-	-	-	-	-	-	-	-	-	-	-	1	6	5	2	2	1	1	-	4	4	2	1	-	3	3	-	-	-	-	-	-	-	-	1	2	/15

*Data for November 30, 1948, will be included with the data for December 1948 in the CRPL-F53.

Table 58a*

Coronal observations at Climax, Colorado (6704A), east limb

Date GCT	Degrees north of the solar equator 90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	Degrees south of the solar equator 5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	P
1948																																					
Nov. 1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	3	3	3	5	4	4	3	2	1	-	-	-	-	-	X	X	X	X	X	/25
5.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	7	6	4	4	4	4	3	2	2	1	-	-	-	-	-	-	-	-	-	-	/25
13.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	/20
14.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2	2	2	2	2	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	/20
15.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	/20
21.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	/20
28.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	/15

*Data for November 30, 1948, will be included with the data for December 1948 in the CRPL-F53.

Table 56b*

Coronal observations at Climax, Colorado (5303A), west limb

Date GCT	Degrees south of the solar equator 90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	Degrees north of the solar equator 5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	P
1948																																					
Nov. 1.7	X	X	X	X	X	-	-	-	-	-	4	4	5	5	9	13	14	10	7	11	14	13	10	8	8	7	4	-	-	-	-	-	-	-	-	-	-	425
5.8	-	-	-	-	-	2	2	3	4	5	9	11	9	14	13	11	10	10	14	13	13	12	11	11	12	11	10	7	6	-	-	-	-	-	-	-	-	425
13.8	-	-	-	-	-	-	-	-	3	5	8	9	9	8	11	13	18	28	25	14	14	13	12	12	13	11	-	-	-	-	-	-	-	-	-	-	-	420
14.7	-	-	-	-	-	-	3	3	8	10	11	10	9	10	15	16	26	20	14	14	13	12	8	5	3	-	-	-	-	-	-	-	-	-	-	-	-	420
15.6	3	-	-	-	-	3	4	5	9	11	12	12	13	14	15	23	27	25	20	23	16	13	12	13	17	15	-	-	-	-	-	-	-	-	-	-	-	420
21.7	-	-	-	-	-	-	2	3	3	3	7	11	13	12	12	18	17	12	10	11	11	12	14	16	17	17	10	5	3	-	-	-	-	-	-	-	-	420
28.7	-	-	-	-	-	-	3	3	3	4	8	9	10	11	12	15	15	14	14	14	15	17	20	16	12	10	6	5	3	-	-	-	-	-	-	-	-	415

*Data for November 30, 1948, will be included with the data for December 1948 in the CRPL-F53.

Table 57b*

Coronal observations at Climax, Colorado (6374A), west limb

Date GCT	Degrees south of the solar equator 90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	Degrees north of the solar equator 5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	P
1948																																					
Nov. 1.7	X	X	X	X	X	-	-	-	-	-	-	-	2	1	-	-	12	14	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	425
5.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	1	2	1	-	-	-	-	-	-	-	-	-	-	425
13.8	1	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	1	1	-	-	2	10	3	1	-	1	1	1	1	-	-	-	-	-	-	-	-	420
14.7	-	2	2	2	-	1	1	1	-	-	-	-	-	-	8	9	1	1	1	1	1	2	2	2	5	10	3	1	-	-	-	-	1	1	1	1	1	420
15.6	3	4	2	1	1	-	1	1	1	-	-	-	-	-	3	9	11	3	-	-	-	-	-	10	10	9	-	-	-	-	-	-	-	-	-	-	-	420
21.7	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	10	11	11	10	9	10	7	5	5	2	1	-	-	-	-	-	-	-	-	-	-	-	420
28.7	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	1	1	11	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	415

*Data for November 30, 1948, will be included with the data for December 1948 in the CRPL-F53.

Table 58b*

Coronal observations at Climax, Colorado (6704A), west limb

Date GCT	Degrees south of the solar equator 90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	Degrees north of the solar equator 5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	P
1948																																					
Nov. 1.7	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	425
5.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	425
13.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	420
14.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	420
15.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2	2	2	2	2	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	420
21.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	420
28.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	415

*Data for November 30, 1948, will be included with the data for December 1948 in the CRPL-F53.

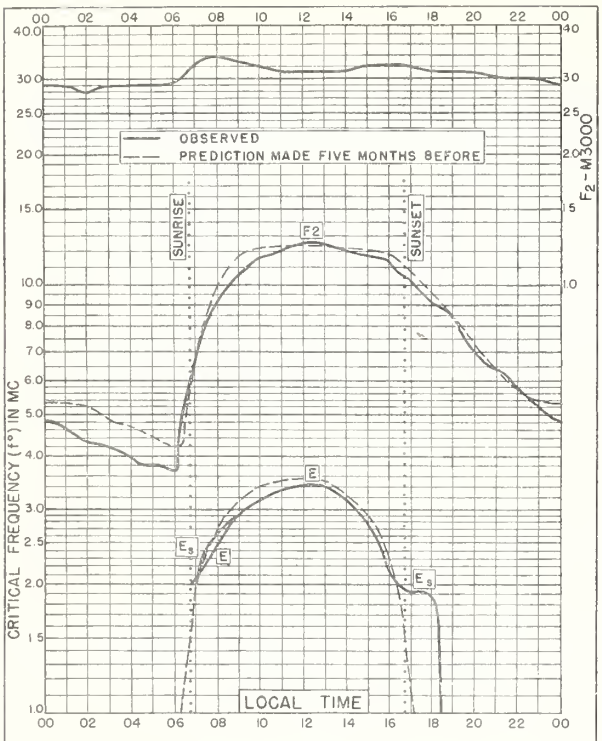


Fig. 1. WASHINGTON, D. C.
39.0°N, 77.5°W NOVEMBER 1948

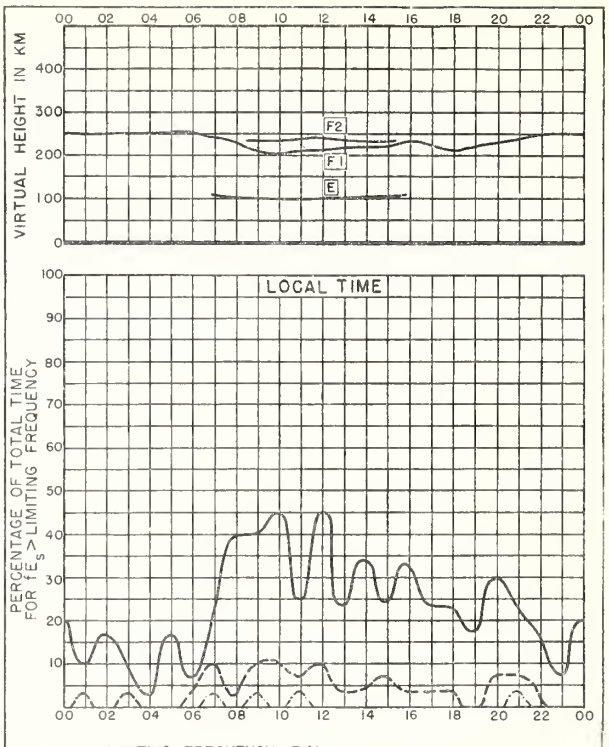


Fig. 2. WASHINGTON, D. C. NOVEMBER 1948

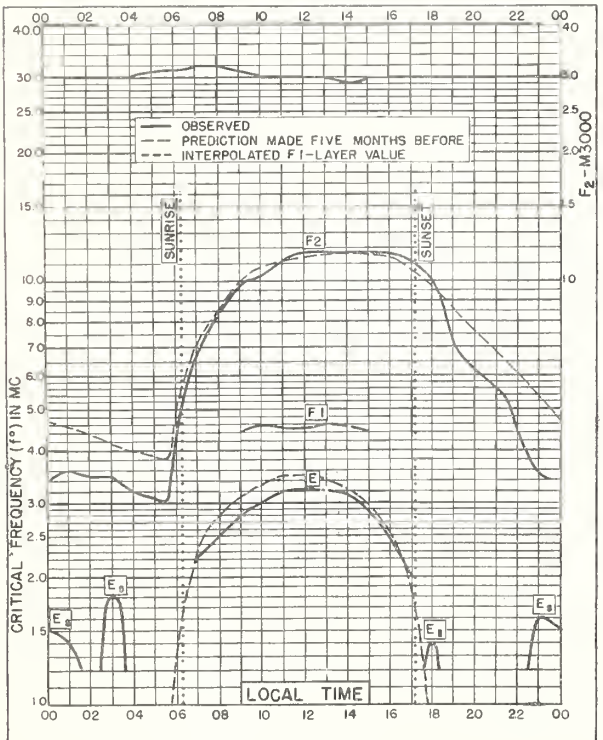


Fig. 3. ST. JOHN'S, NEWFOUNDLAND
47.6°N, 52.7°W OCTOBER 1948

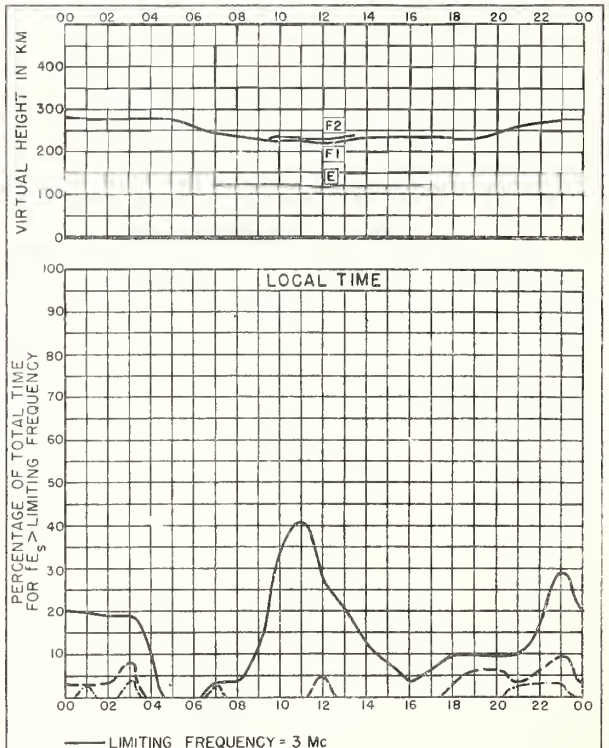


Fig. 4. ST. JOHN'S, NEWFOUNDLAND OCTOBER 1948

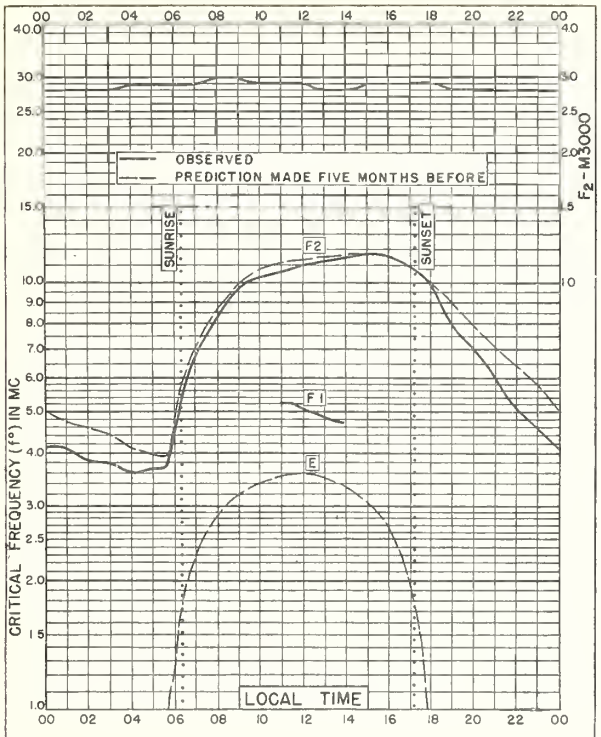


Fig. 5. OTTAWA, CANADA
45.5°N, 75.8°W OCTOBER 1948

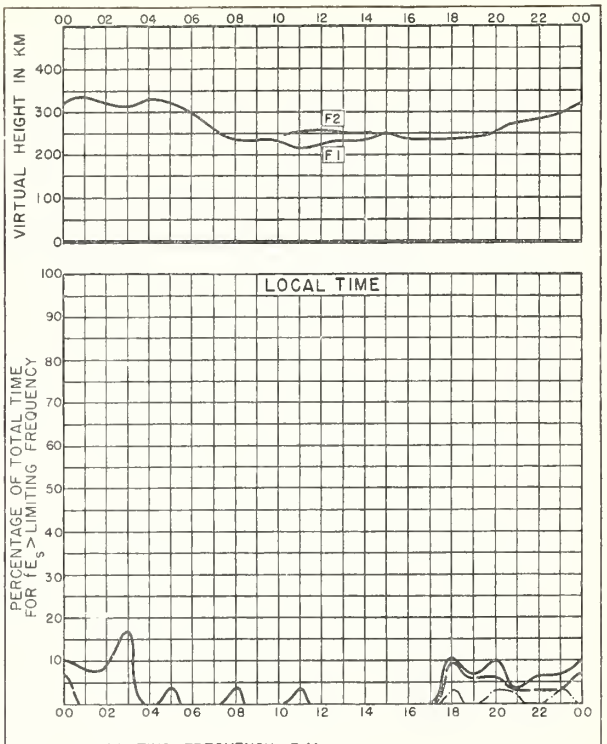


Fig. 6. OTTAWA, CANADA OCTOBER 1948

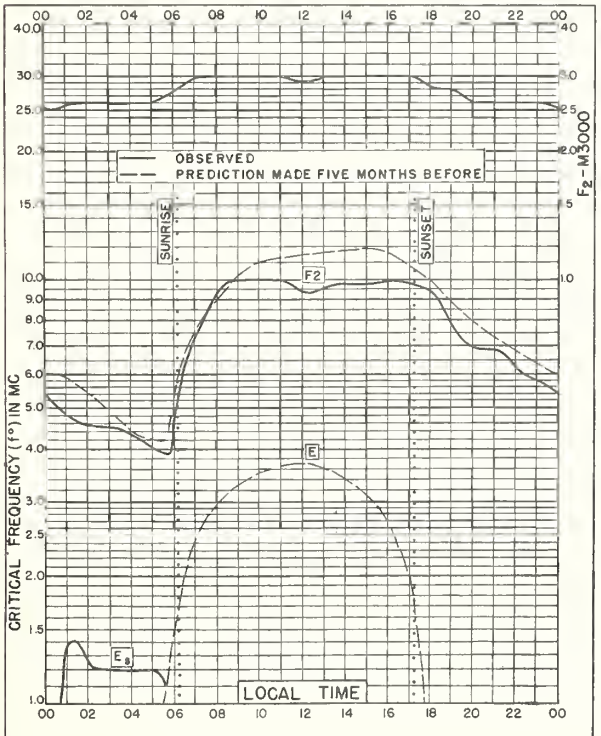


Fig. 7. BOSTON, MASSACHUSETTS
42.4°N, 71.2°W OCTOBER 1948

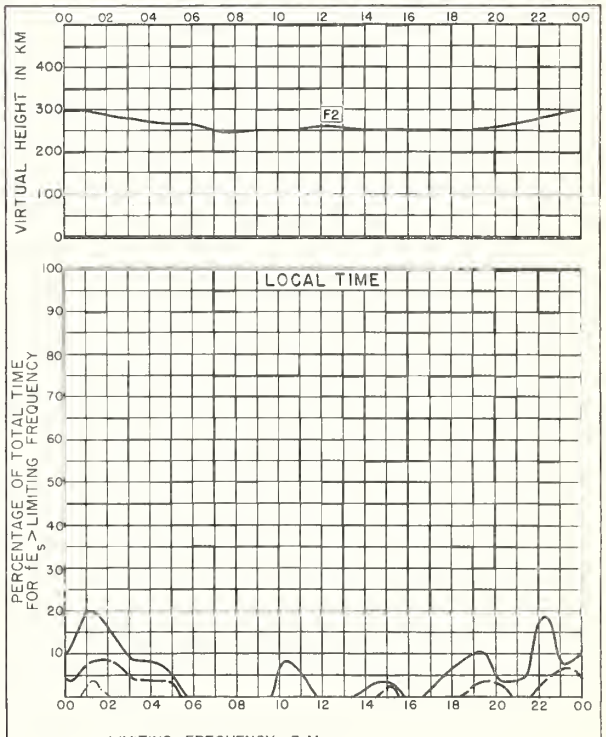


Fig. 8. BOSTON, MASSACHUSETTS OCTOBER 1948

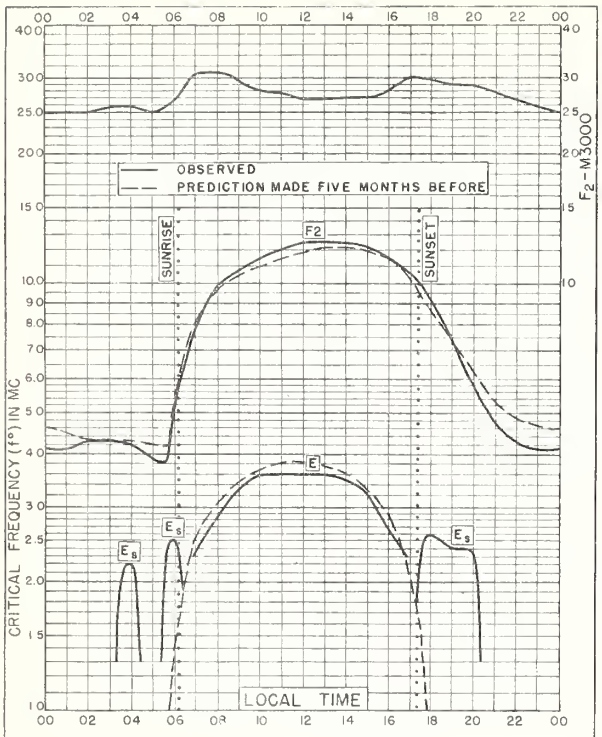


Fig. 9. SAN FRANCISCO, CALIFORNIA
37.4°N, 122.2°W OCTOBER 1948

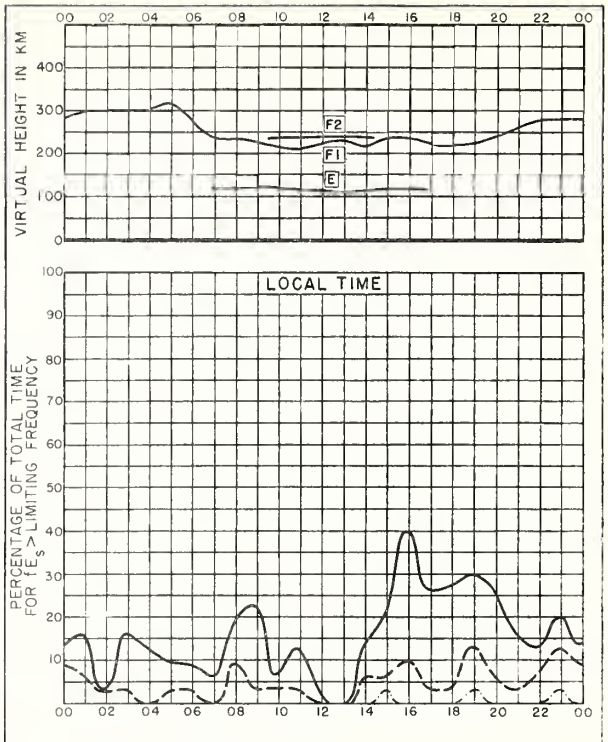


Fig. 10. SAN FRANCISCO, CALIFORNIA OCTOBER 1948

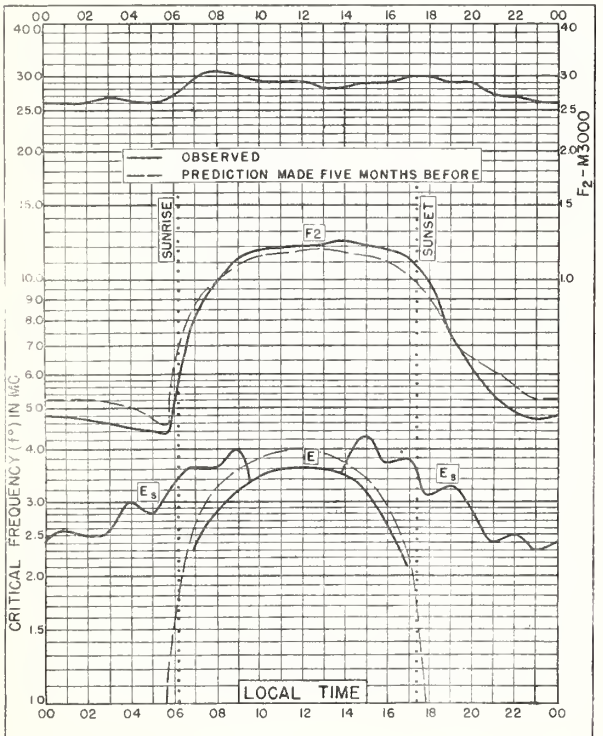


Fig. 11. WHITE SANDS, NEW MEXICO
32.3°N, 106.5°W OCTOBER 1948

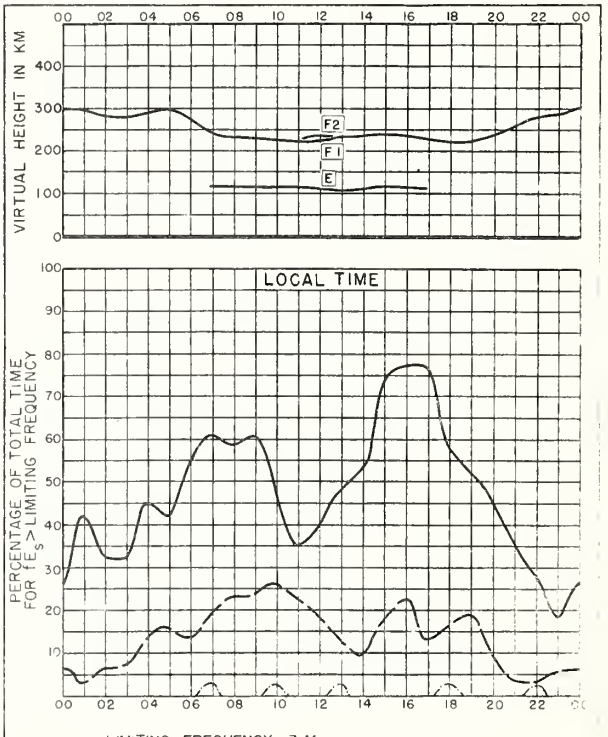


Fig. 12. WHITE SANDS, NEW MEXICO OCTOBER 1948

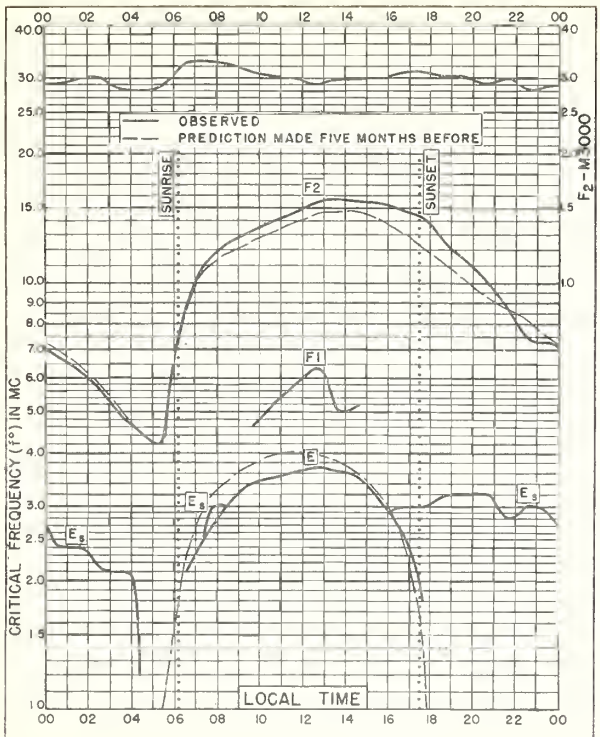


Fig. 13. WUCHANG, CHINA
30.6°N, 114.4°E OCTOBER 1948

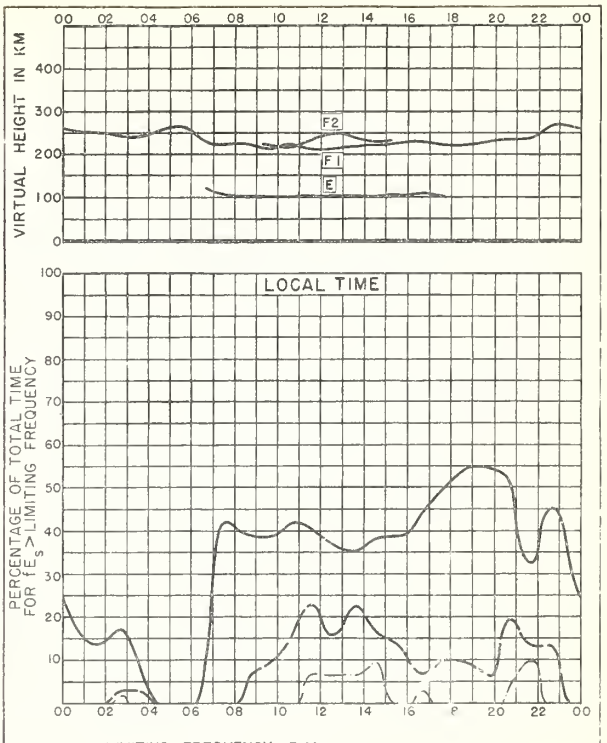


Fig. 14. WUCHANG, CHINA OCTOBER 1948

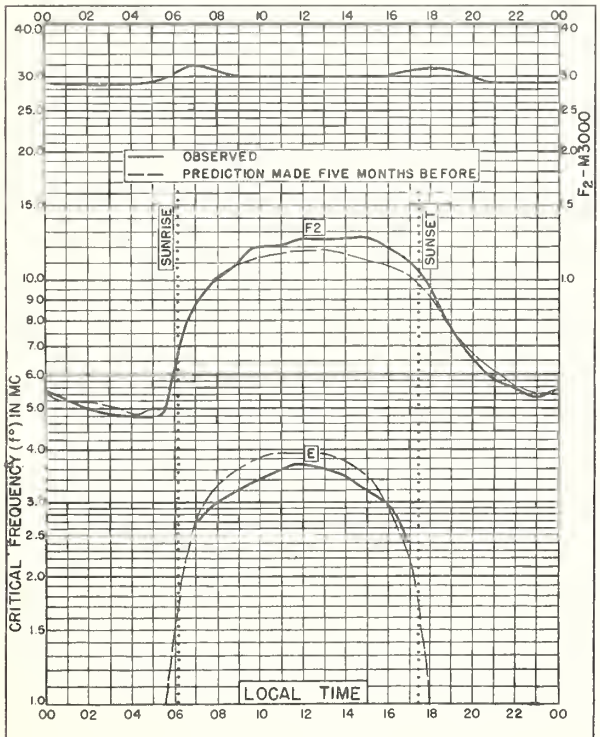


Fig. 15. BATON ROUGE, LOUISIANA
30.5°N, 91.2°W OCTOBER 1948

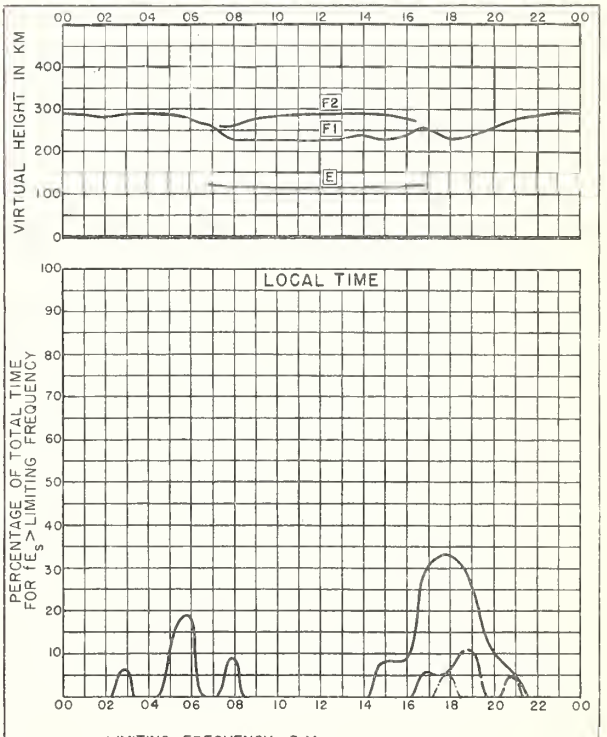


Fig. 16. BATON ROUGE, LOUISIANA OCTOBER 1948

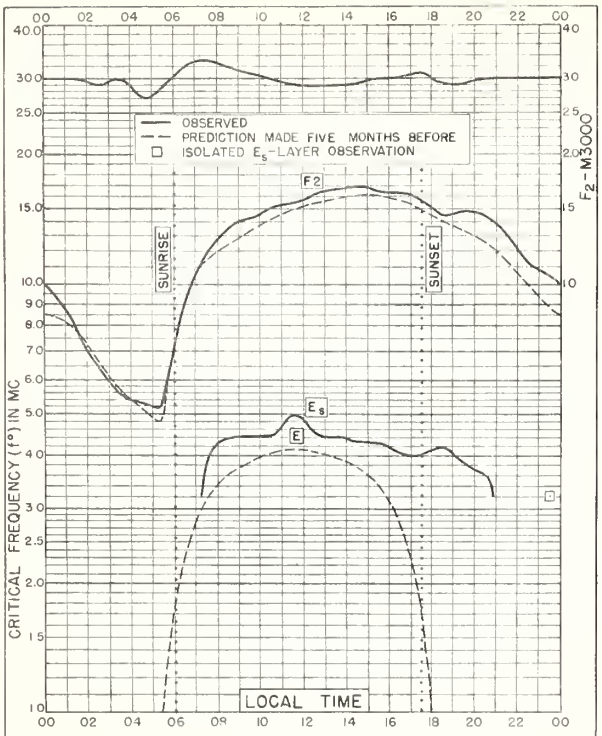


Fig. 17. OKINAWA I.
26.3°N, 127.7°E OCTOBER 1948

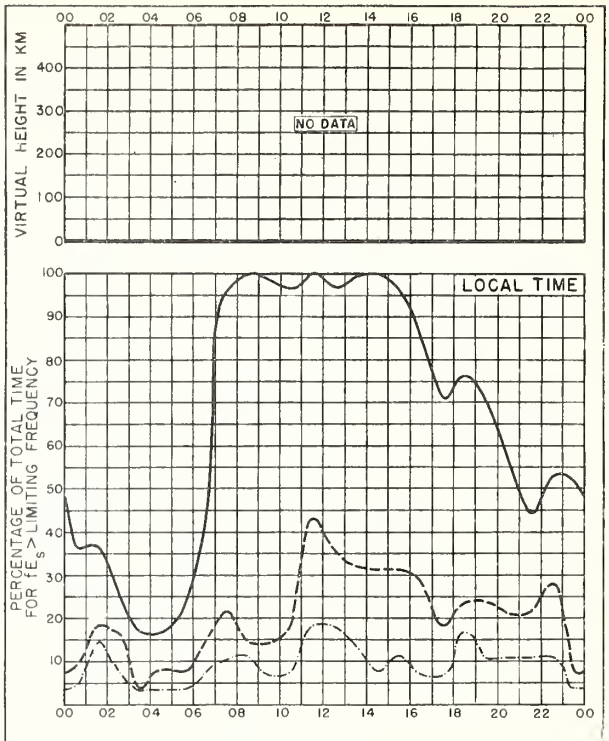


Fig. 18. OKINAWA I. OCTOBER 1948

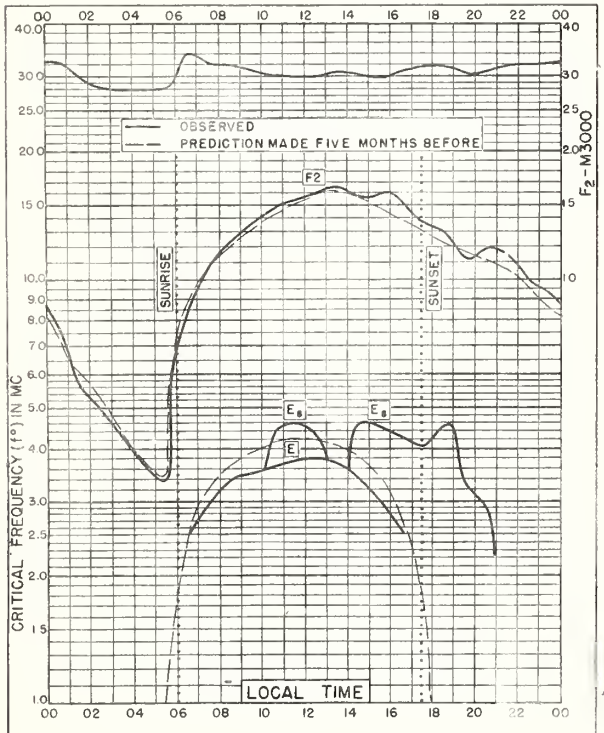


Fig. 19. MAUI, HAWAII
20.8°N, 156.5°W OCTOBER 1948

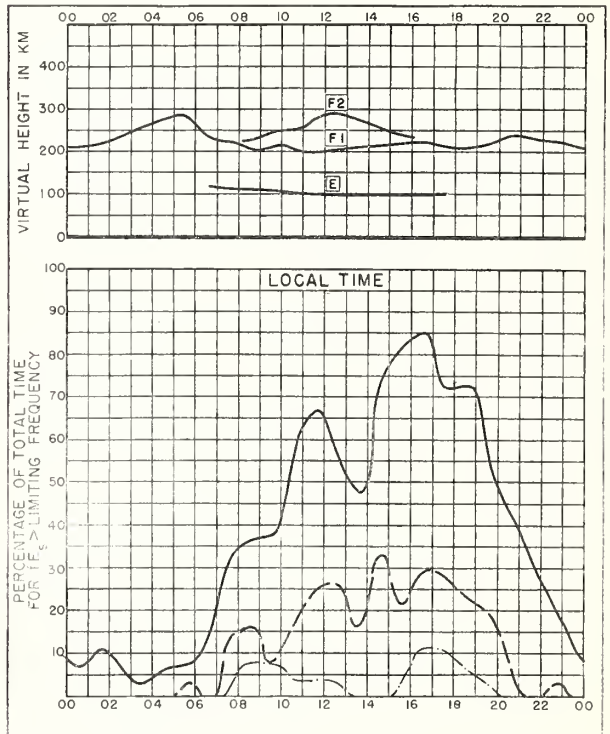


Fig. 20. MAUI, HAWAII OCTOBER 1948

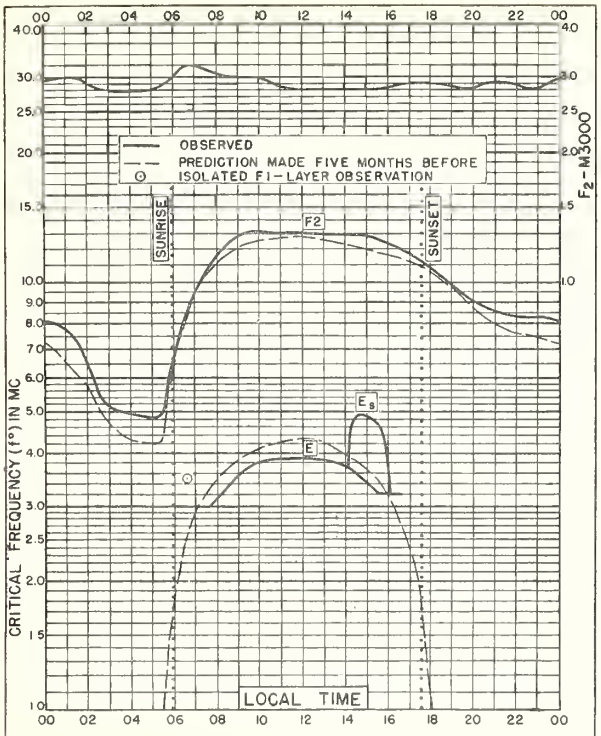


Fig. 21. SAN JUAN, PUERTO RICO
18.4°N, 66.1°W OCTOBER 1948

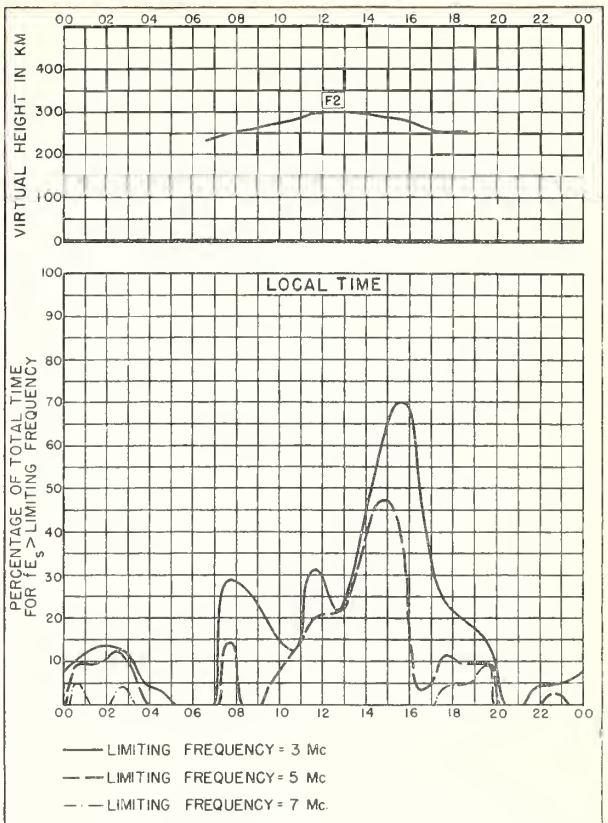


Fig. 22. SAN JUAN, PUERTO RICO OCTOBER 1948

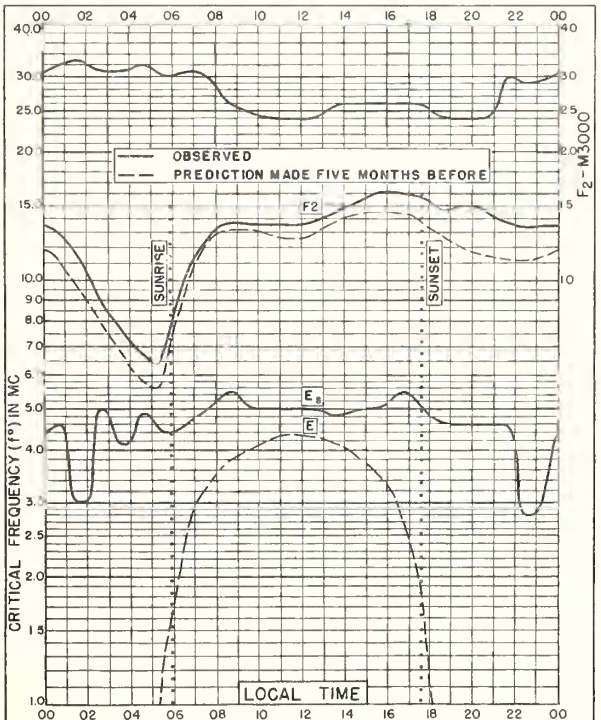


Fig. 23. GUAM I.
13.6°N, 144.9°E OCTOBER 1948

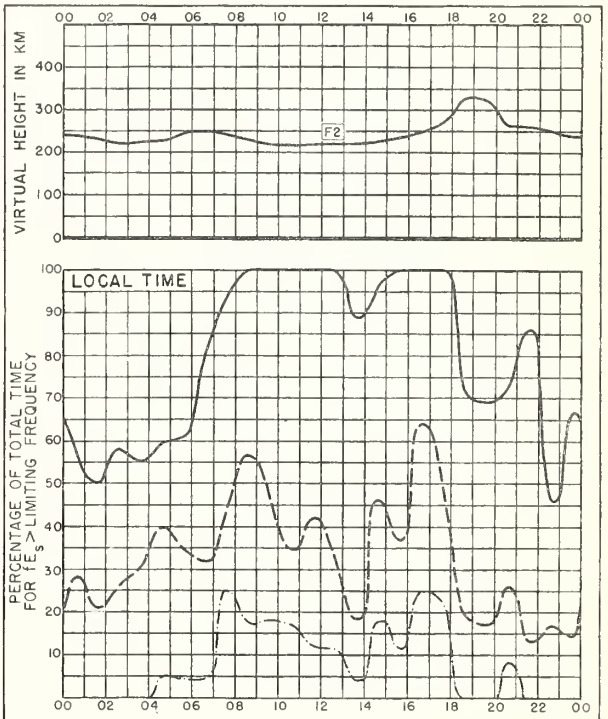


Fig. 24. GUAM I. OCTOBER 1948

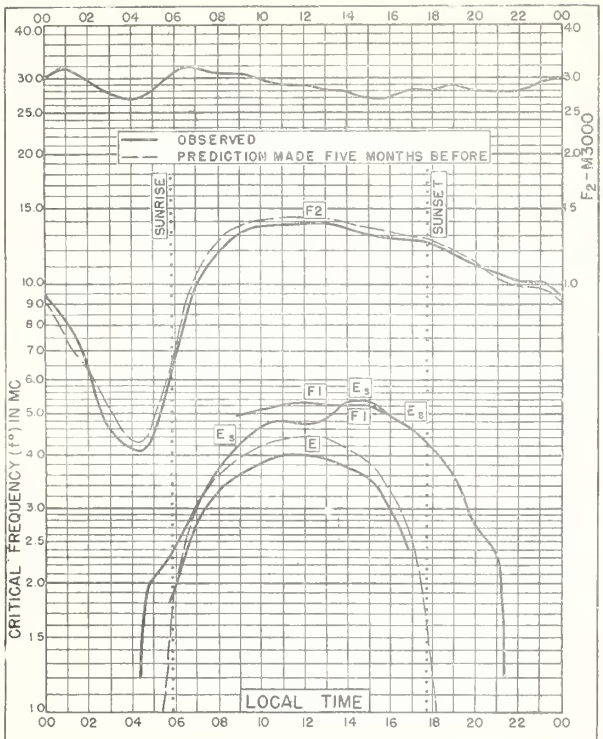


Fig. 25. TRINIDAD, BRIT. WEST INDIES
10. 6°N, 61. 2°W OCTOBER 1948

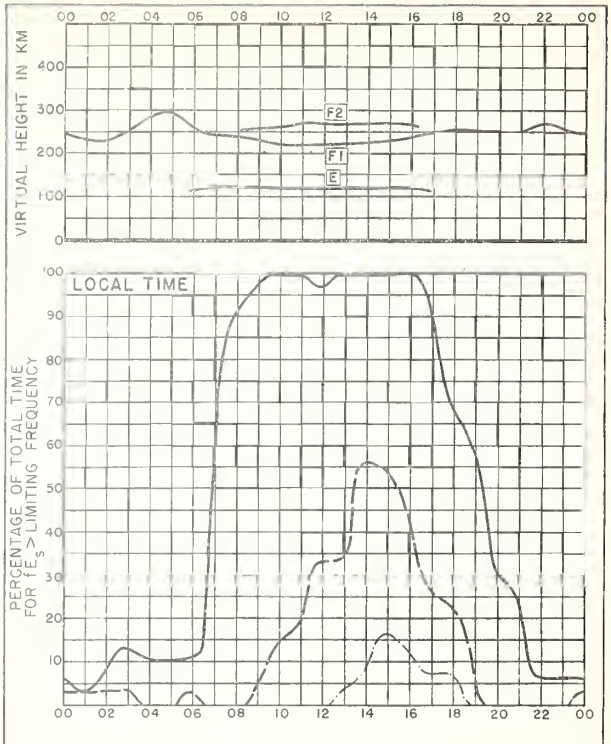


Fig. 26. TRINIDAD, BRIT. WEST INDIES OCTOBER 1948

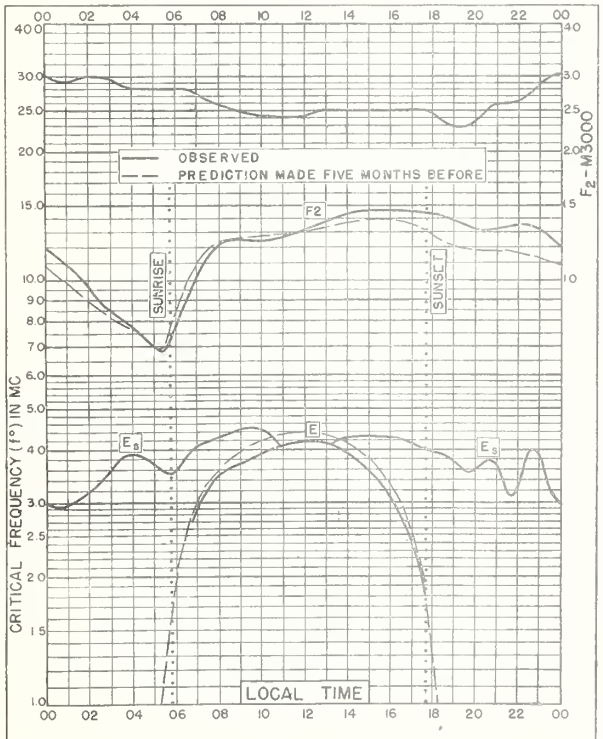


Fig. 27. PALMYRA I.
5. 9°N, 162. 1°W OCTOBER 1948

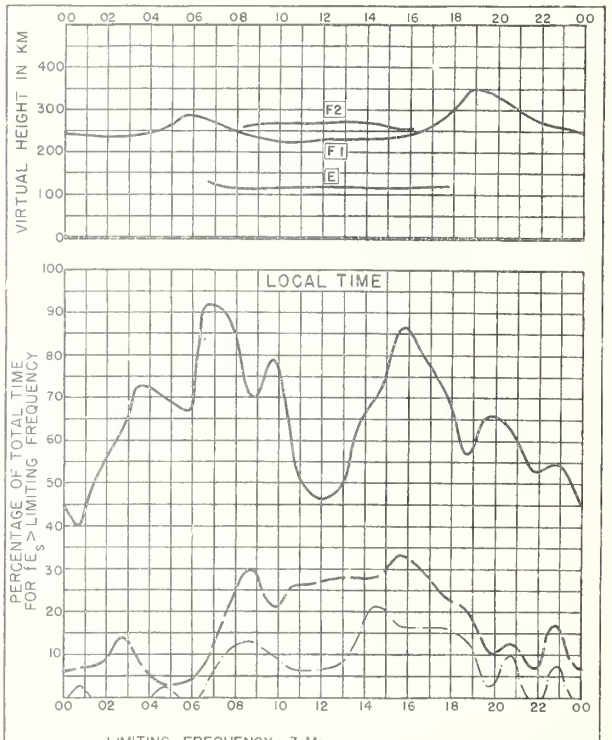


Fig. 28. PALMYRA I. OCTOBER 1948

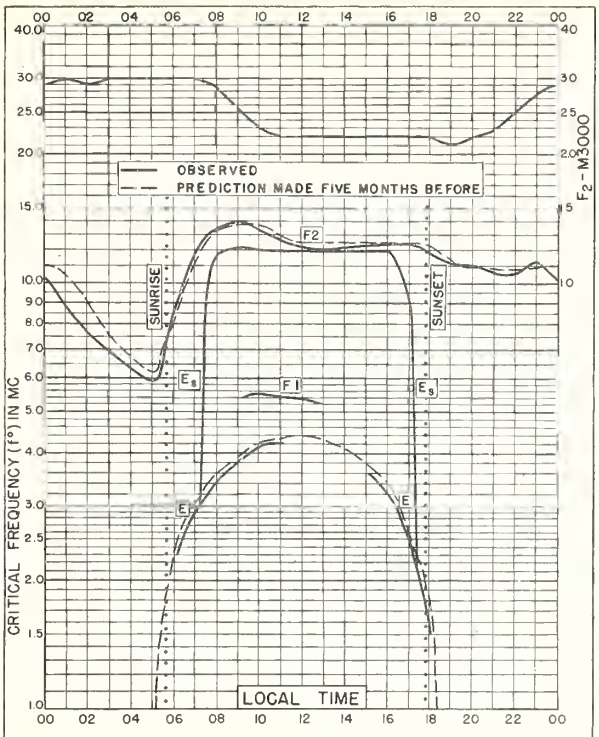


Fig.29. HUANCAYO, PERU
12.0°S, 75.3°W
OCTOBER 1948

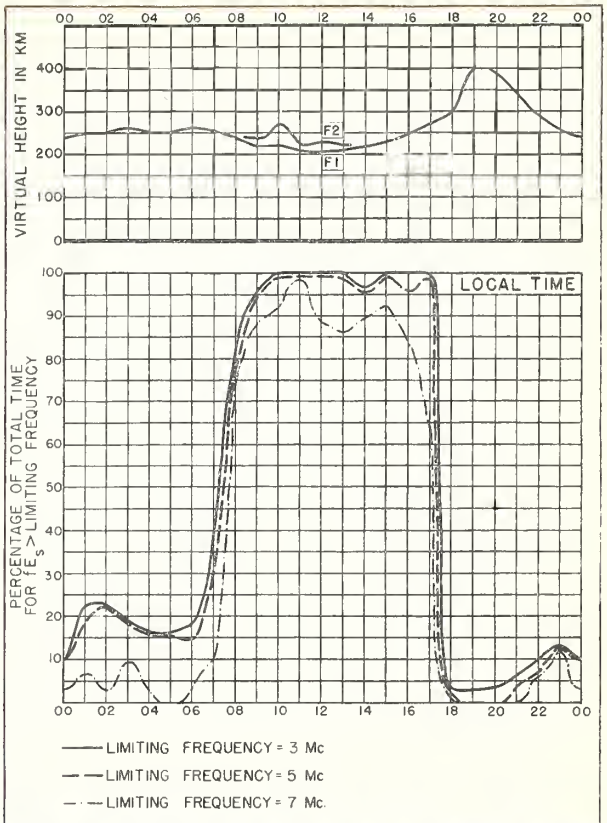


Fig. 30. HUANCAYO, PERU
OCTOBER 1948

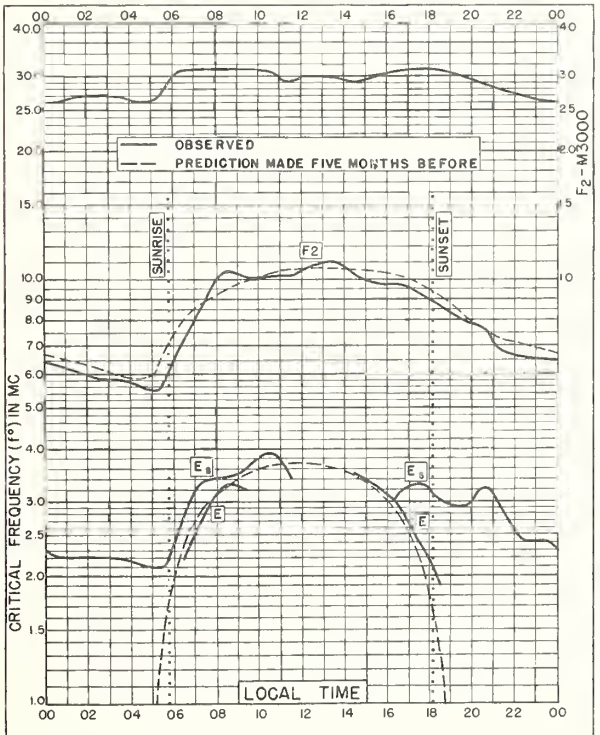


Fig. 31. WAKKANAI, JAPAN
45.4°N, 141.7°E
SEPTEMBER 1948

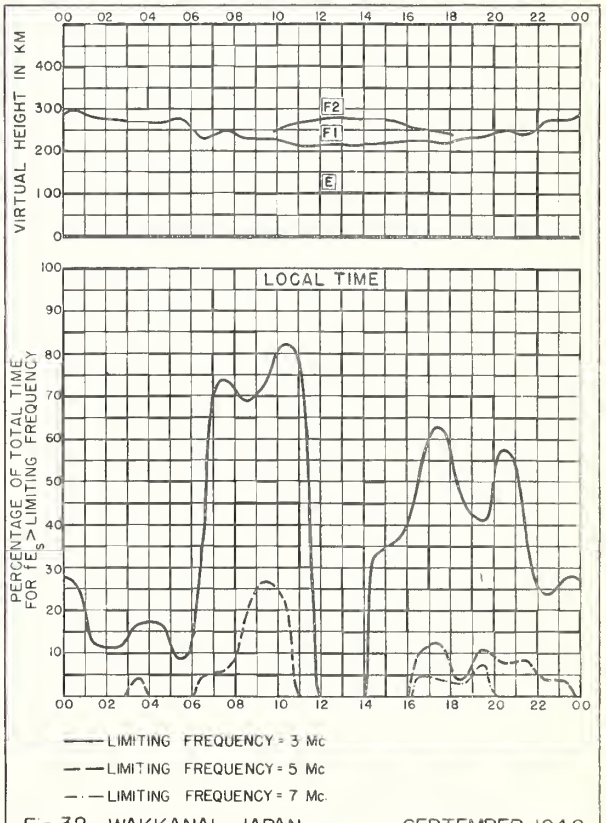


Fig. 32. WAKKANAI, JAPAN
SEPTEMBER 1948

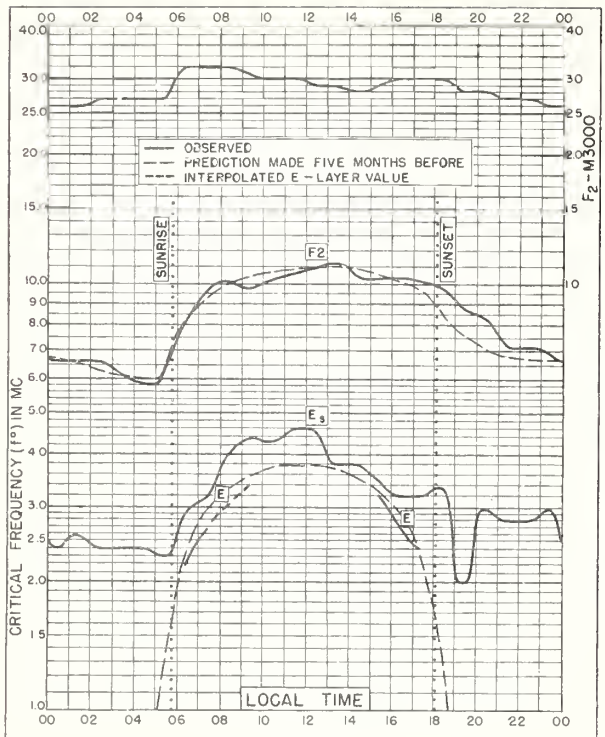


Fig. 33. FUKAURA, JAPAN
40.6°N, 139.9°E SEPTEMBER 1948

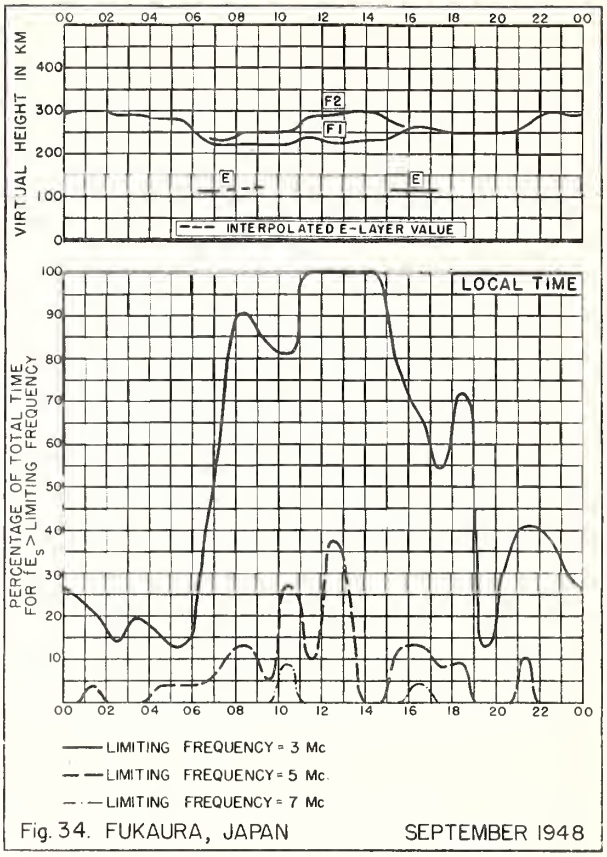


Fig. 34. FUKAURA, JAPAN SEPTEMBER 1948

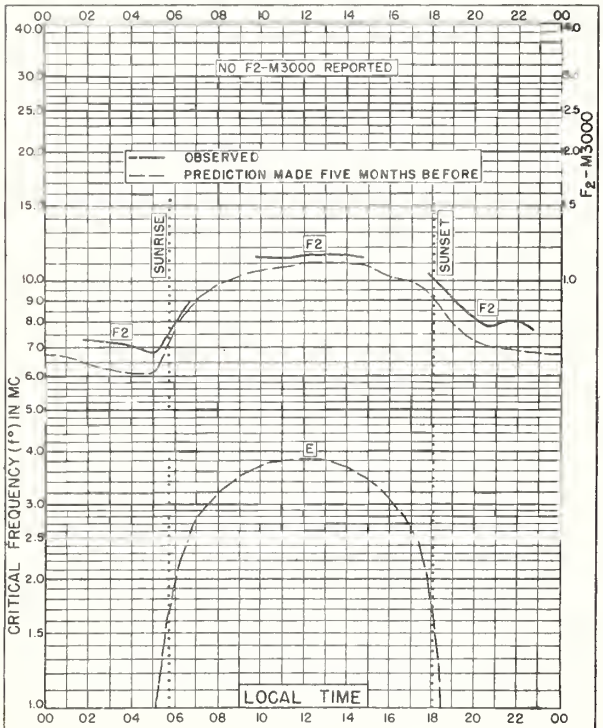
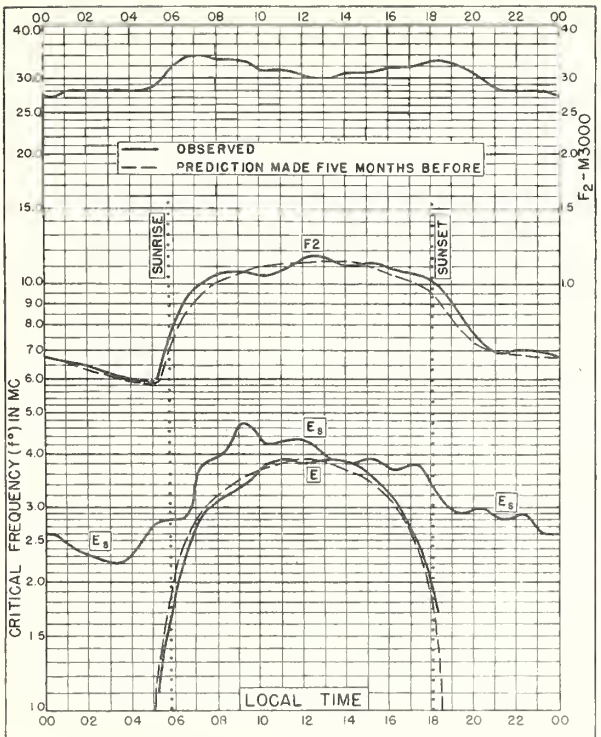


Fig. 35. PEIPING, CHINA
39.9°N, 116.4°E SEPTEMBER 1948



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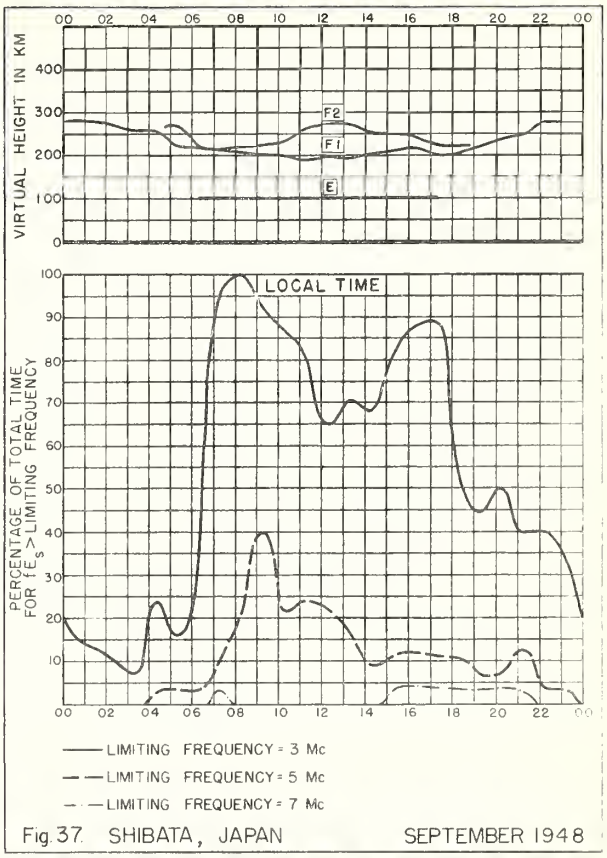

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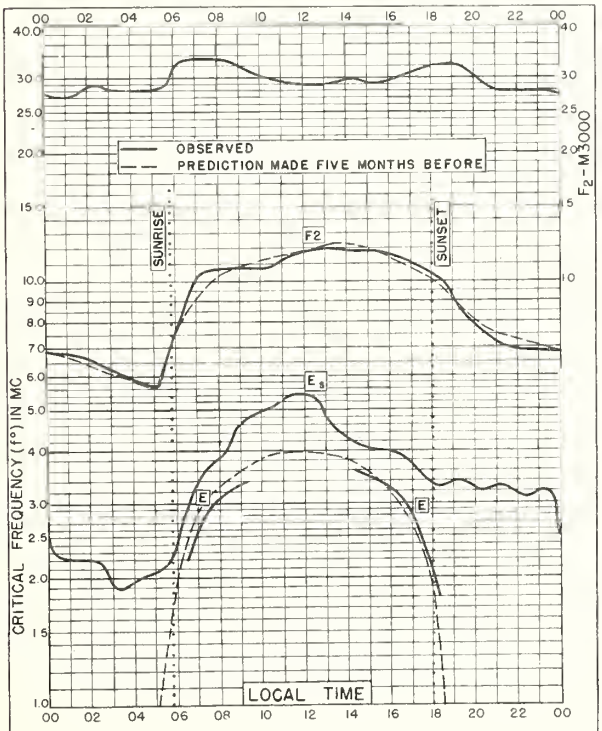

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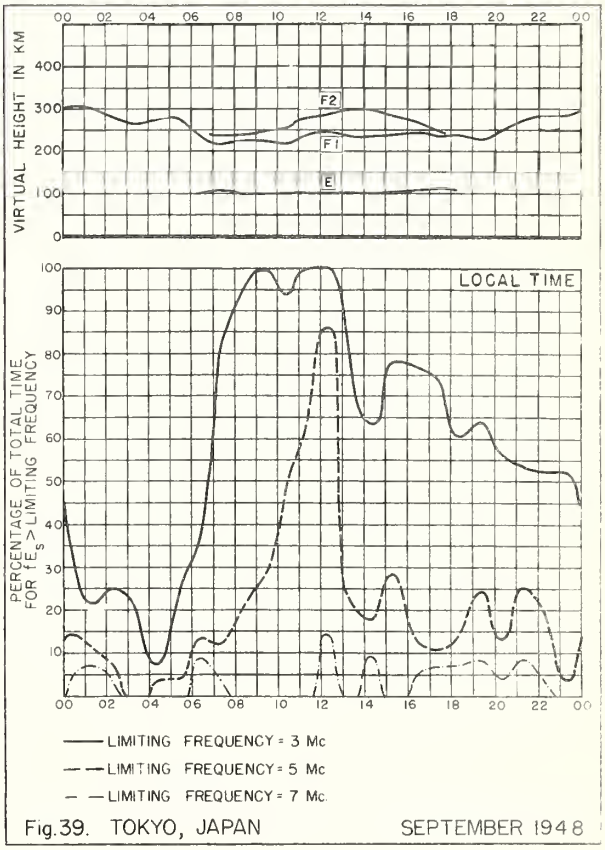

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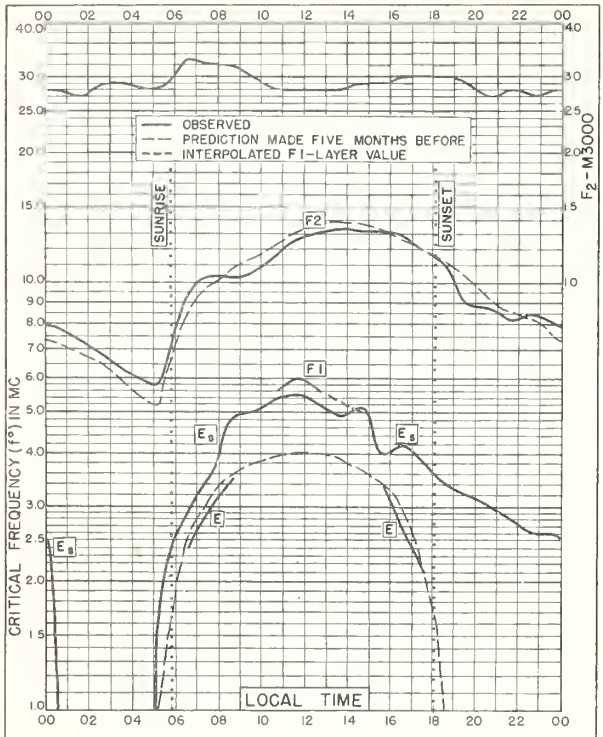

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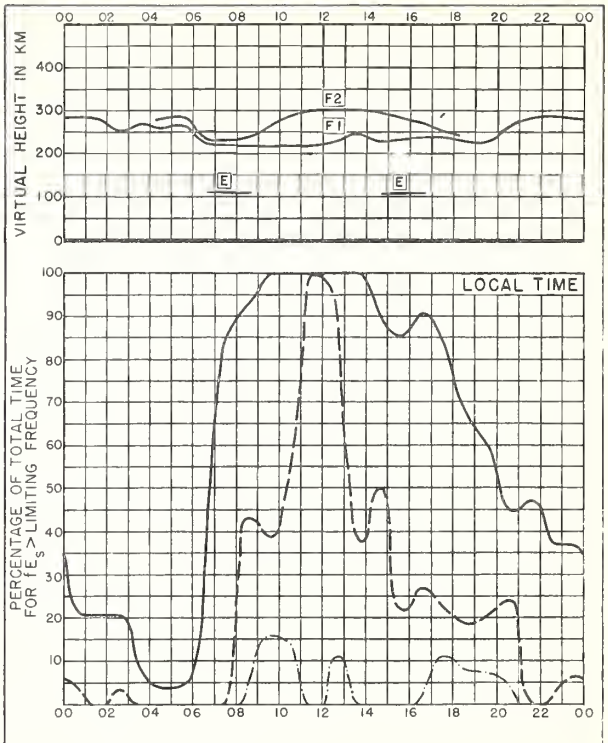

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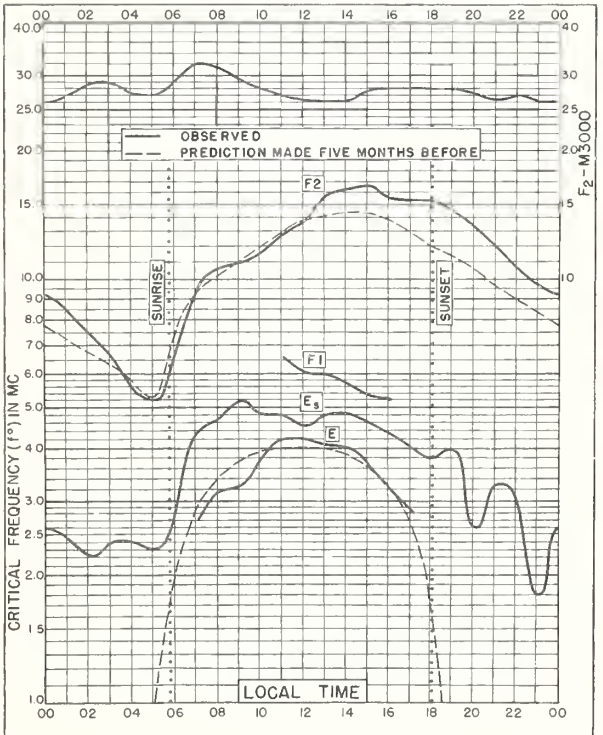

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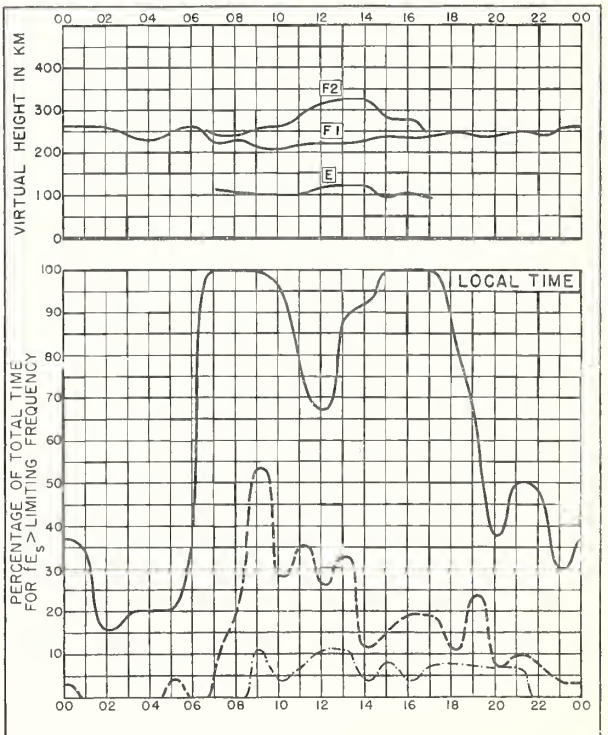

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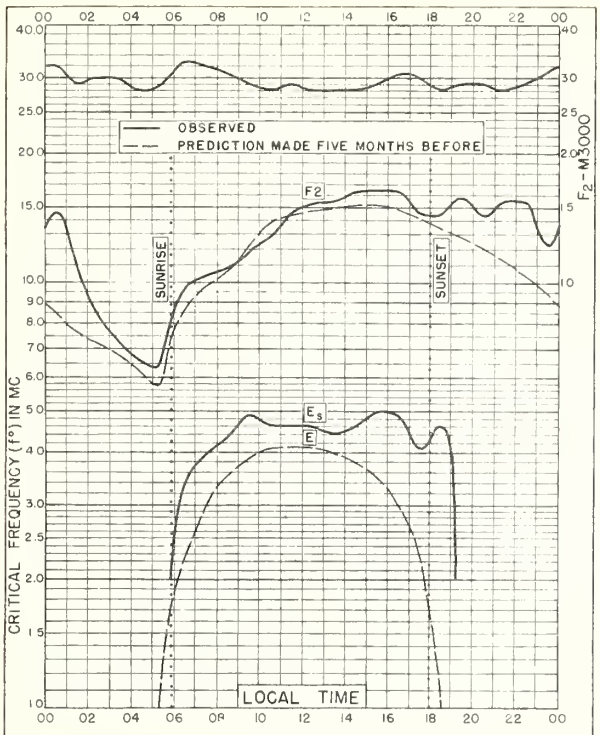

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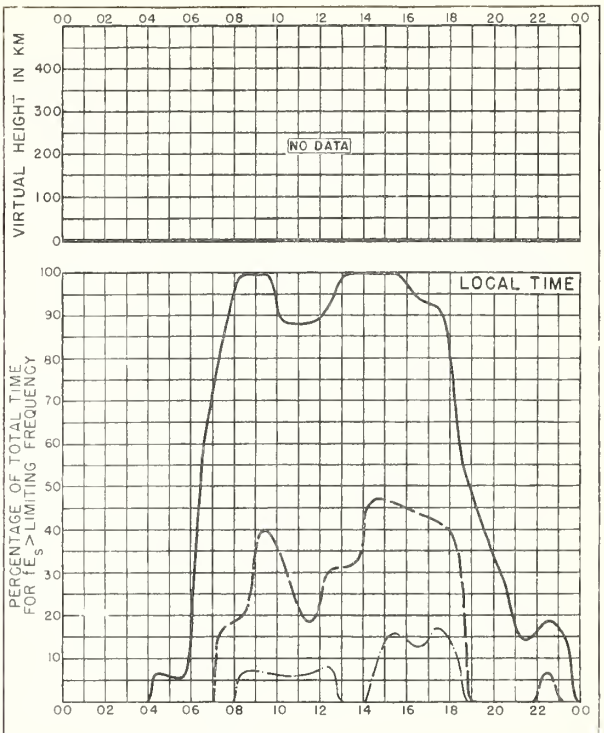

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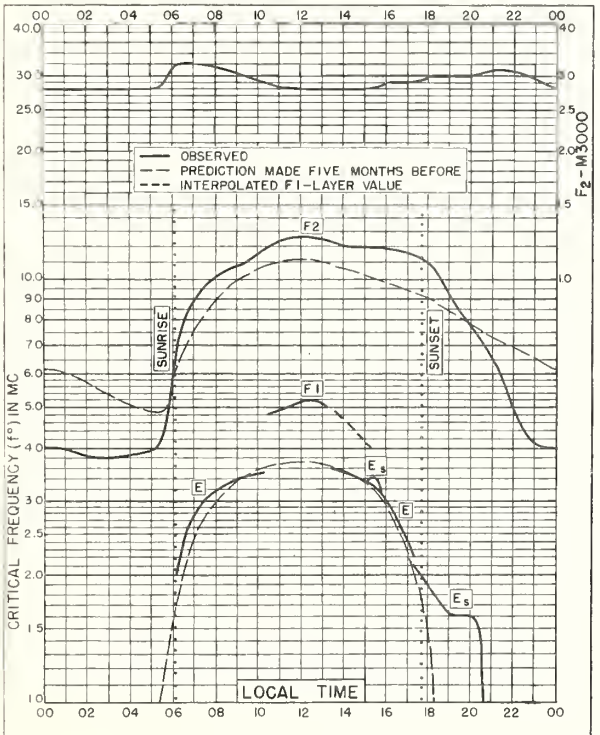

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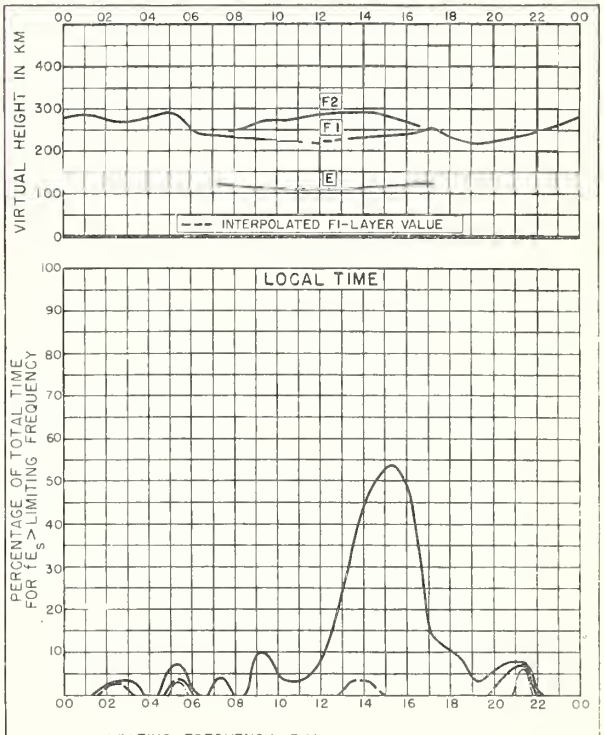

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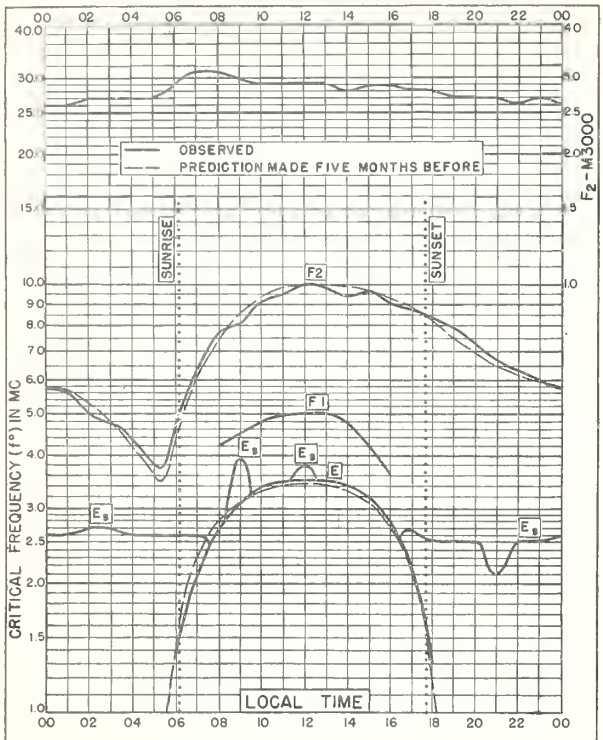

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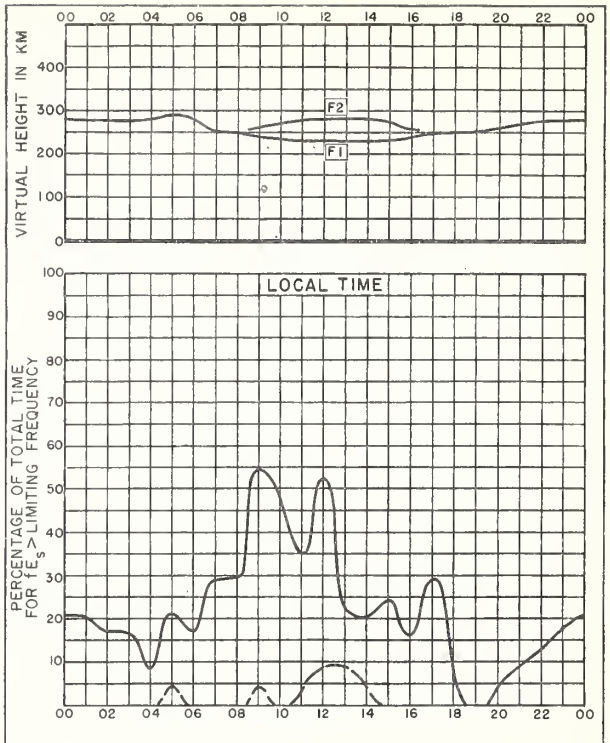

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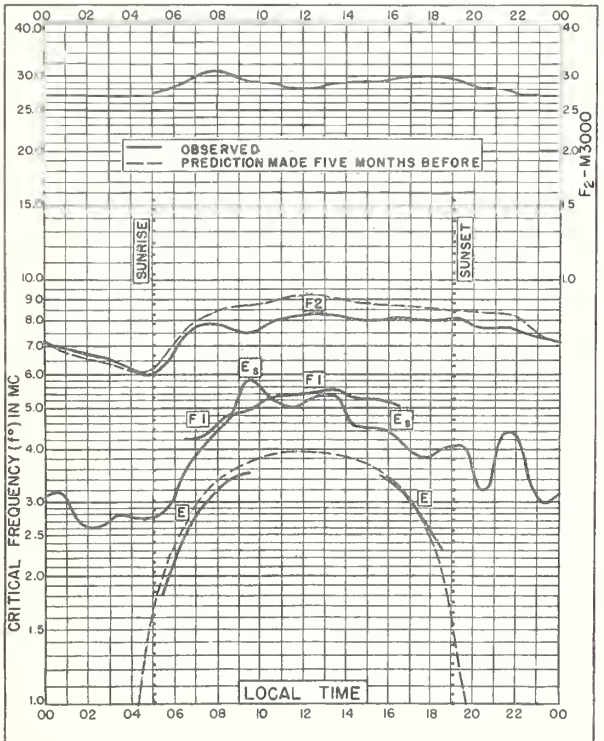

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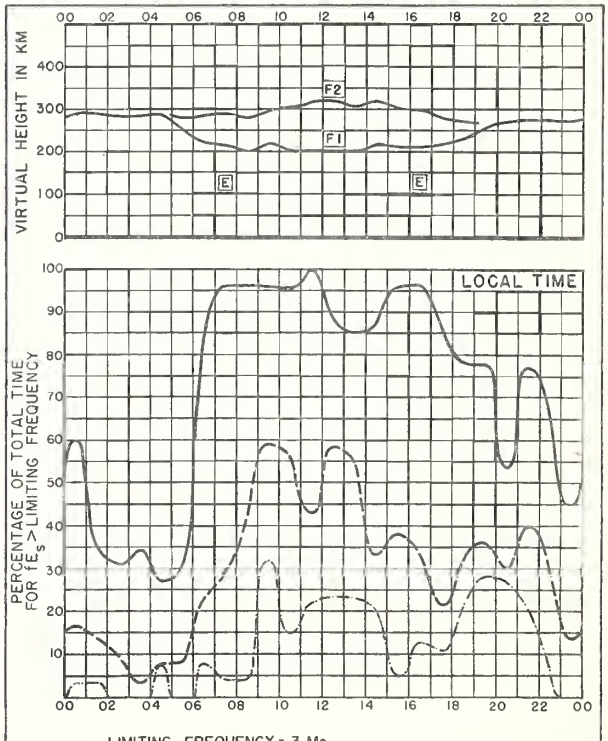

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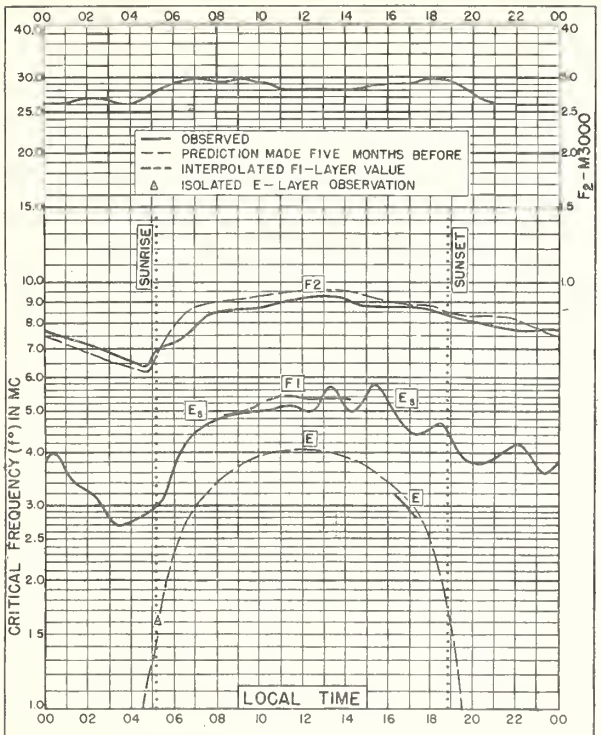

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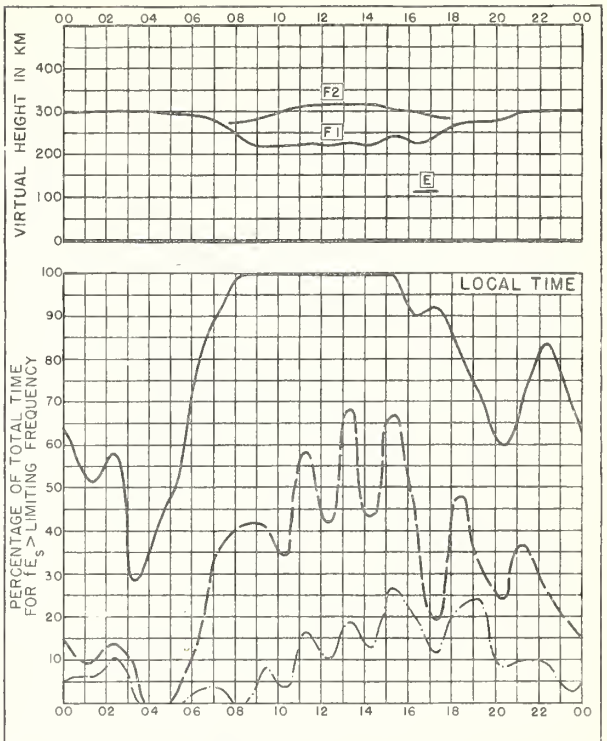

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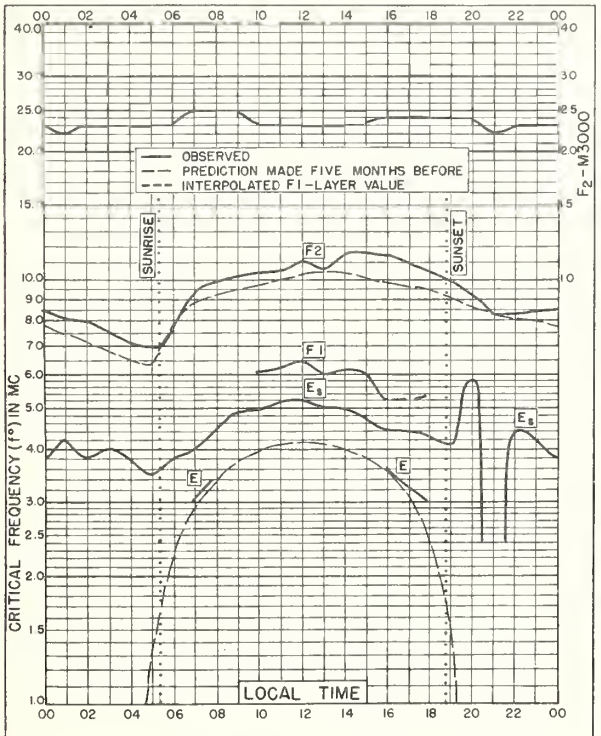

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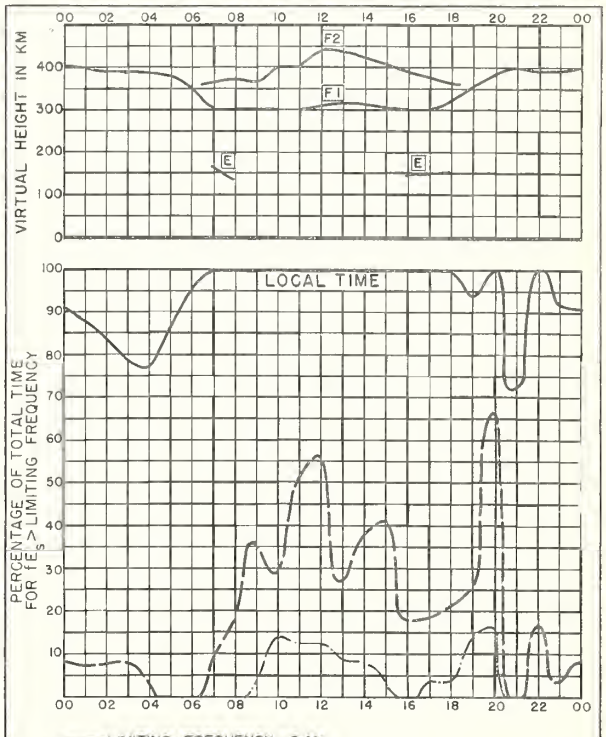

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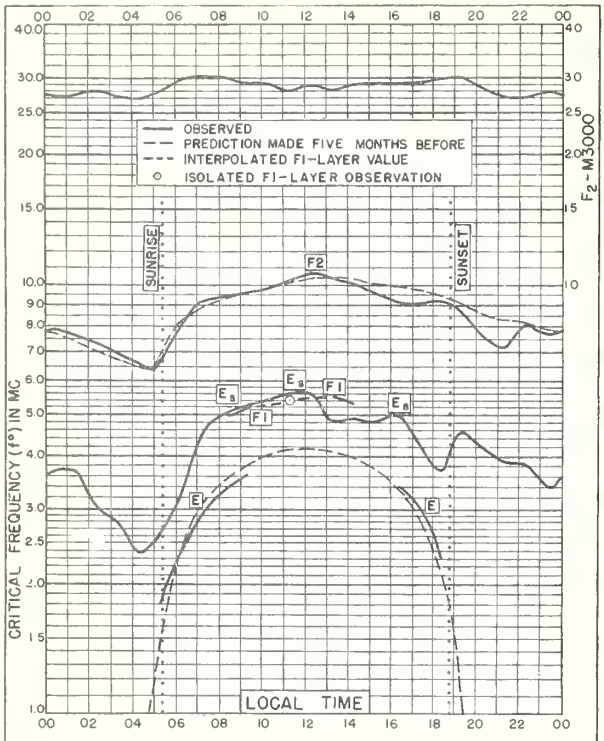

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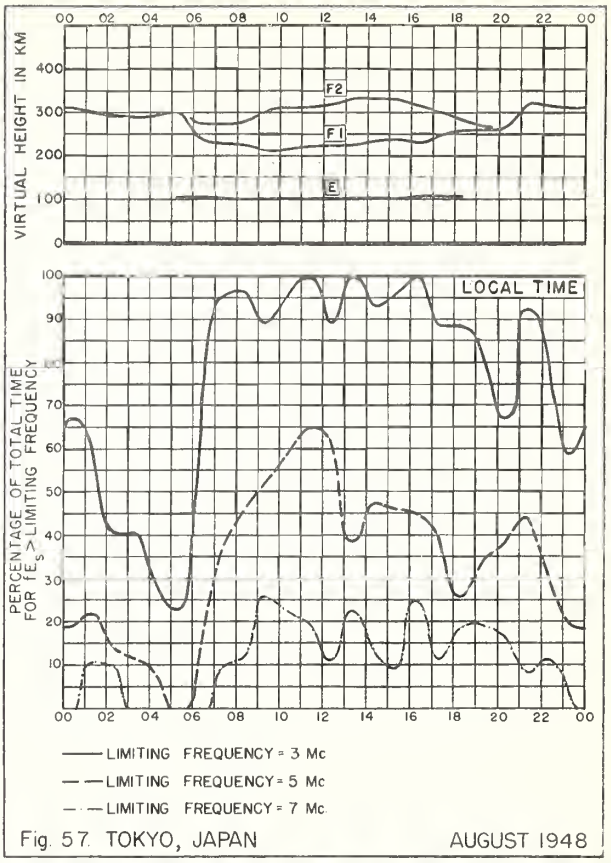

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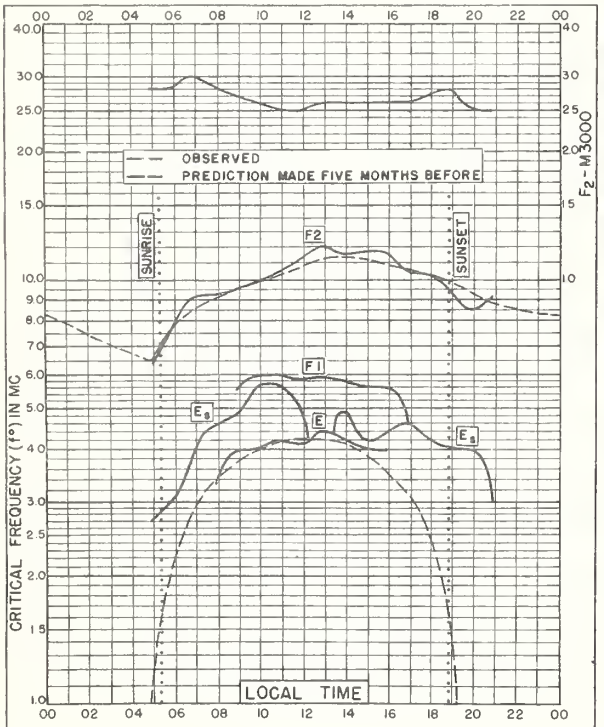

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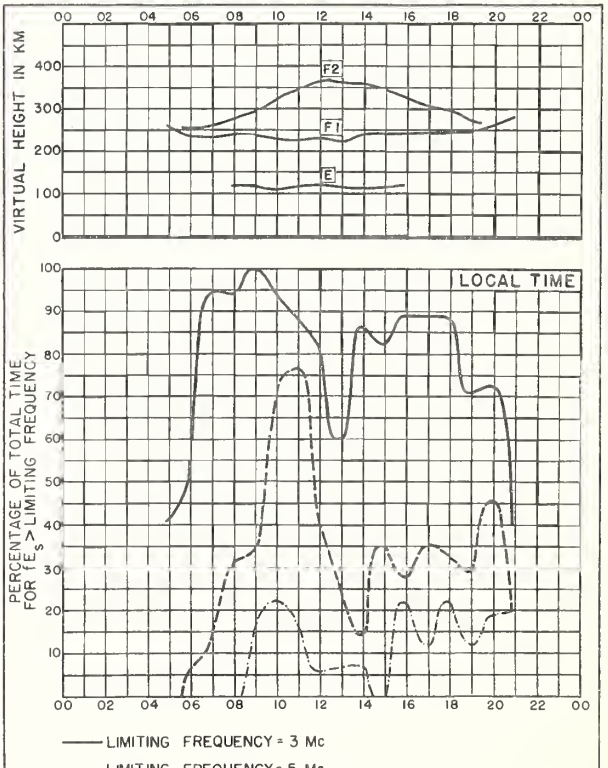

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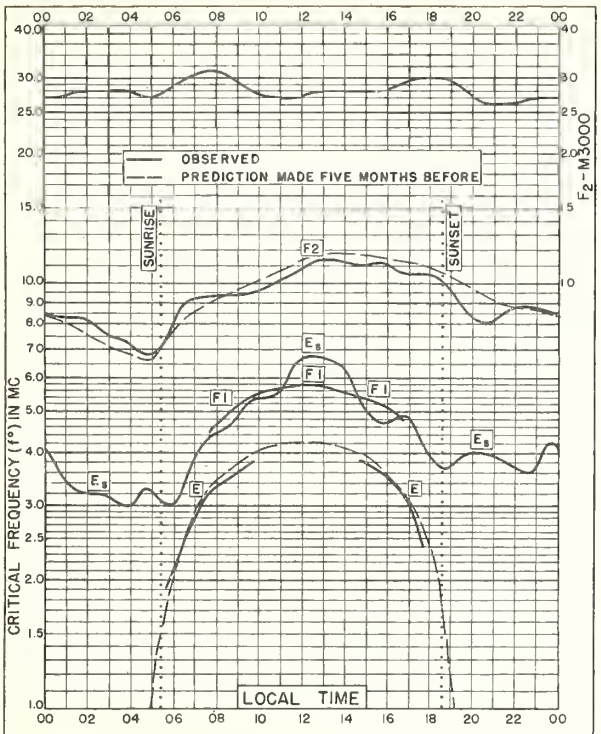

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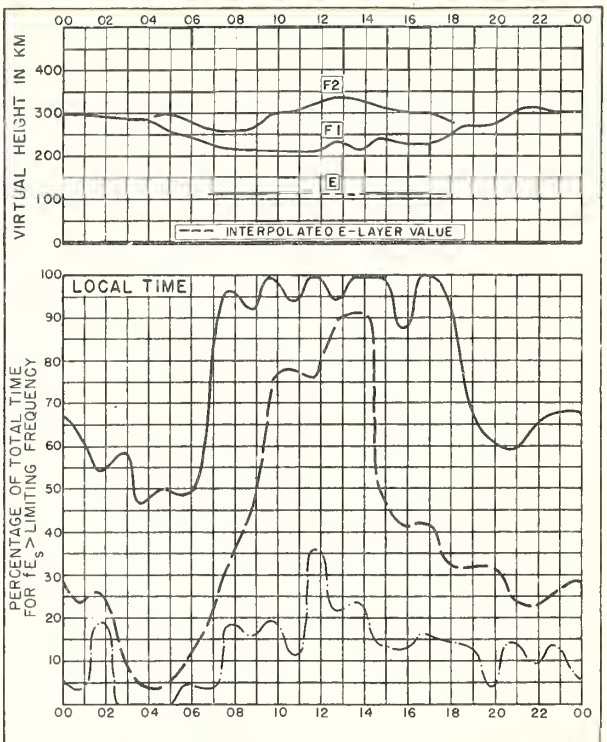

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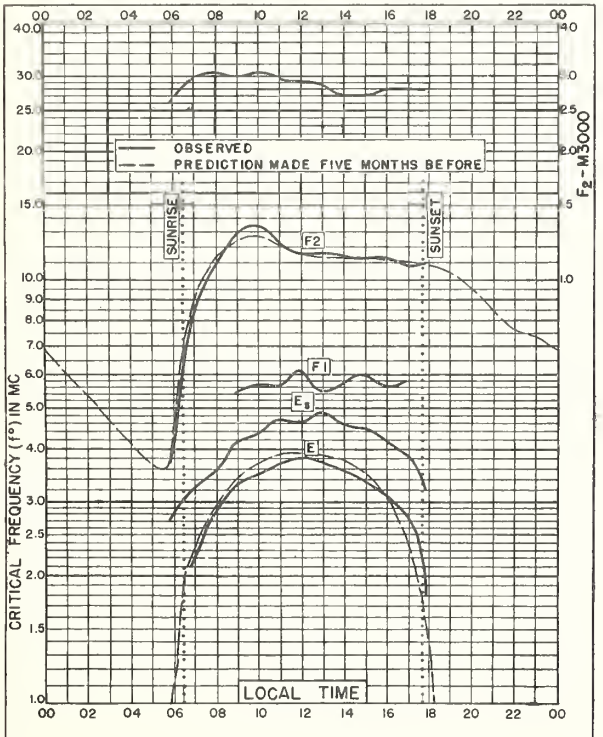

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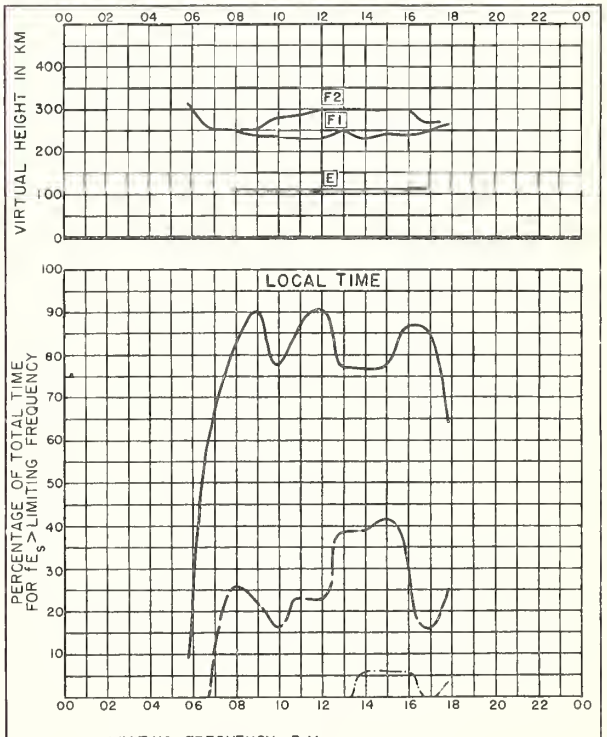

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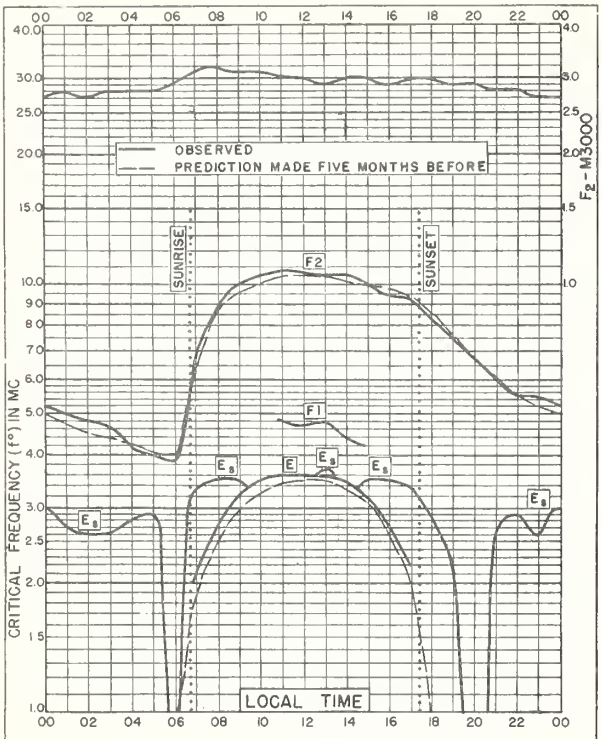

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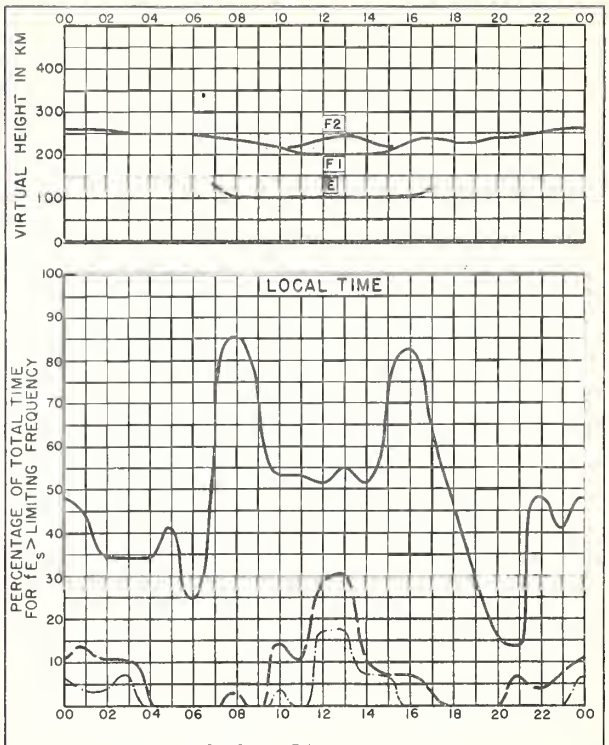

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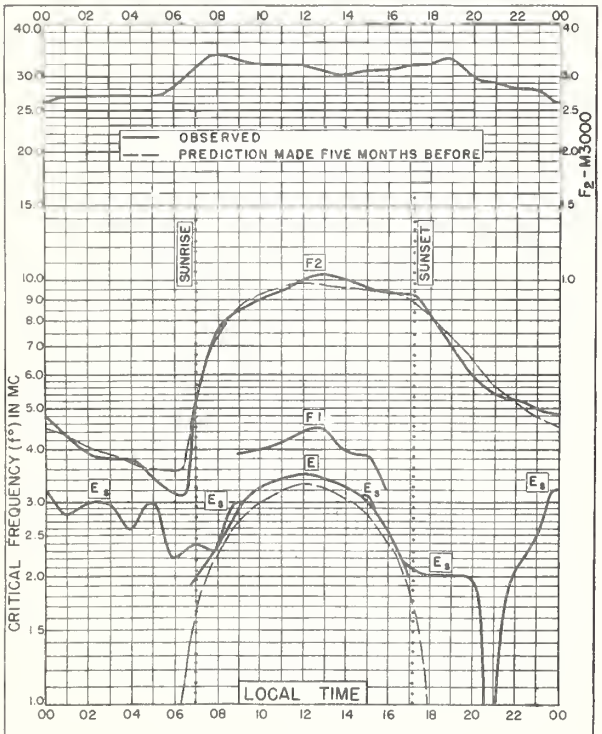

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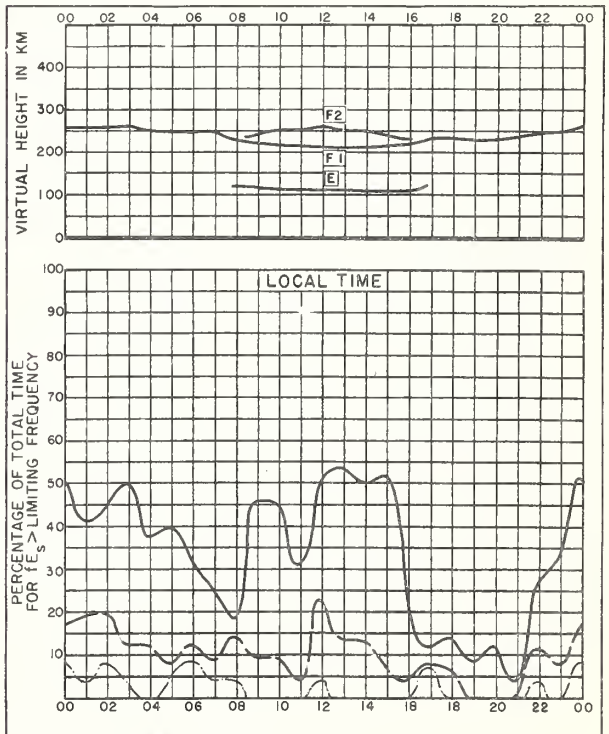

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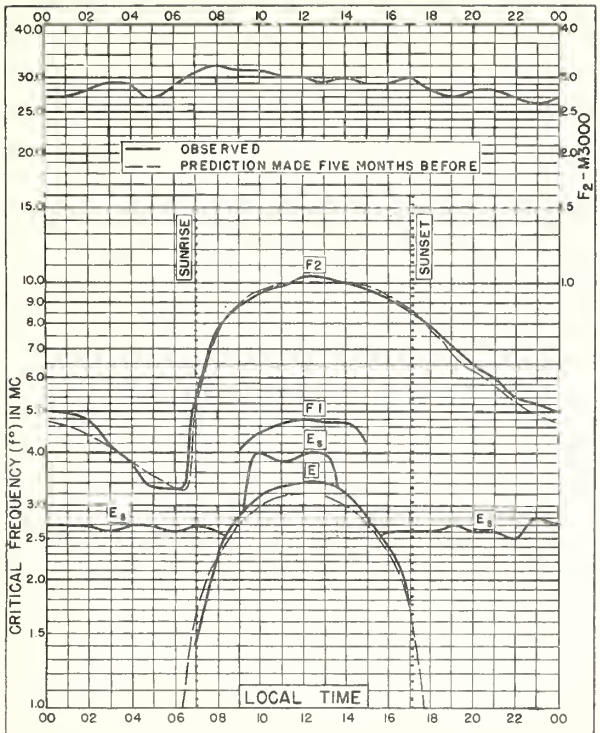

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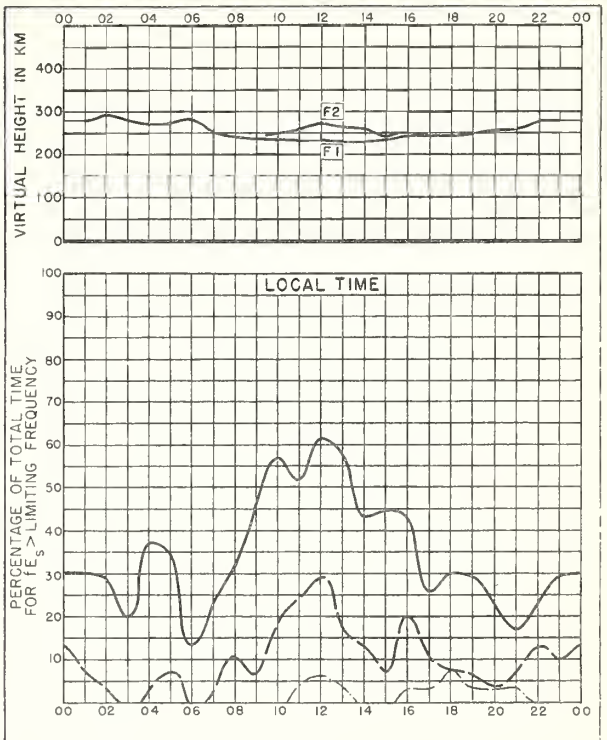

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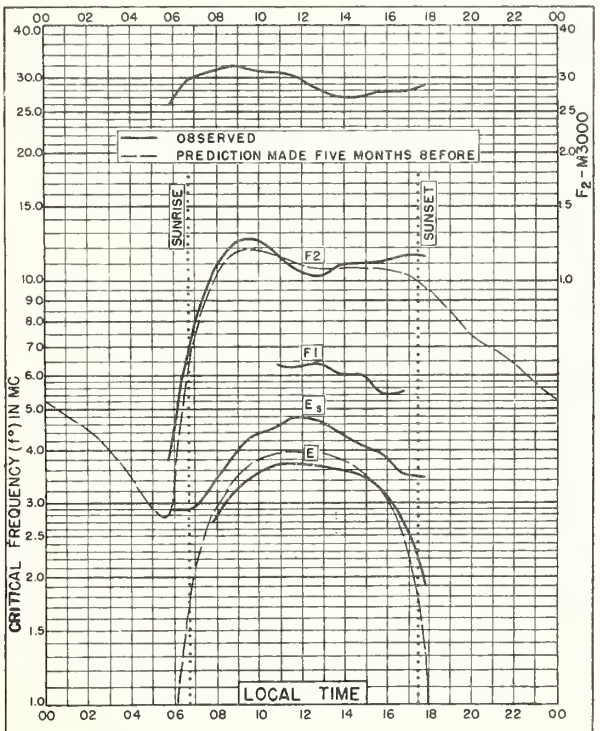

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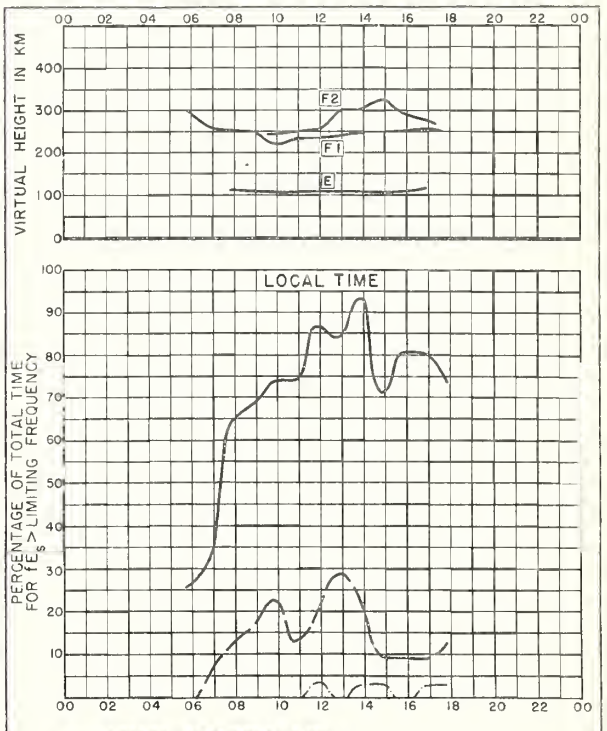

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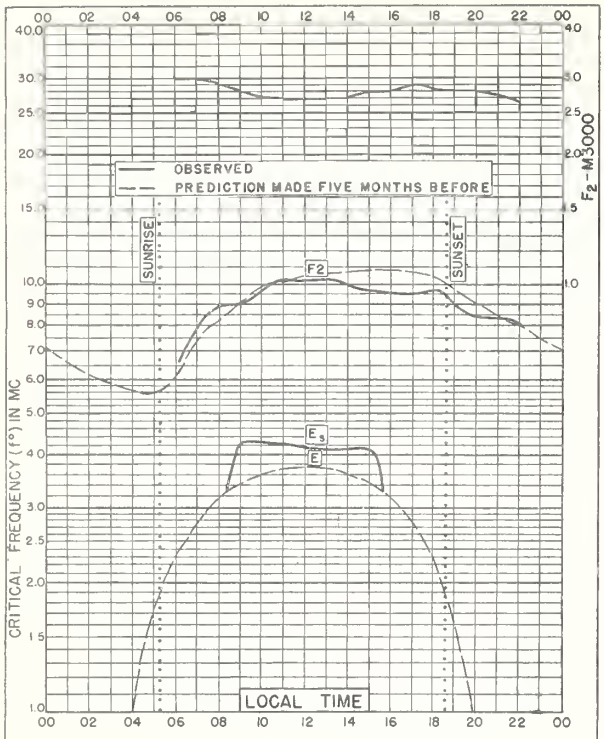

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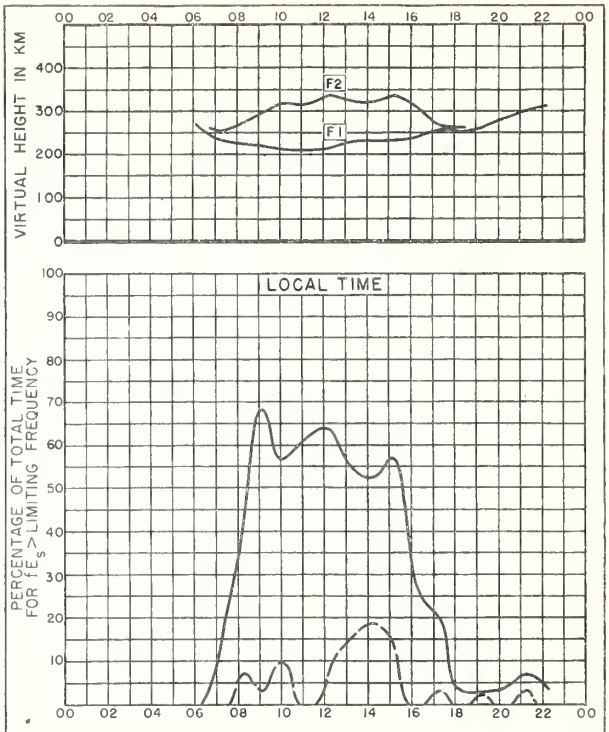

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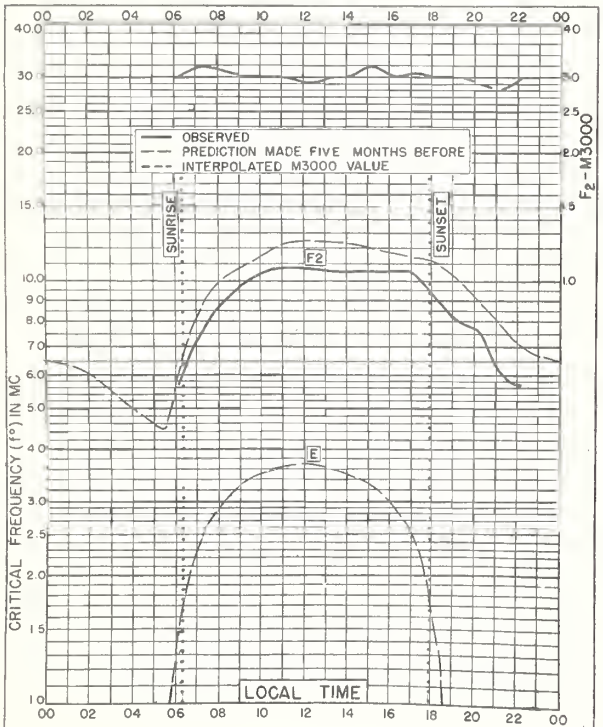

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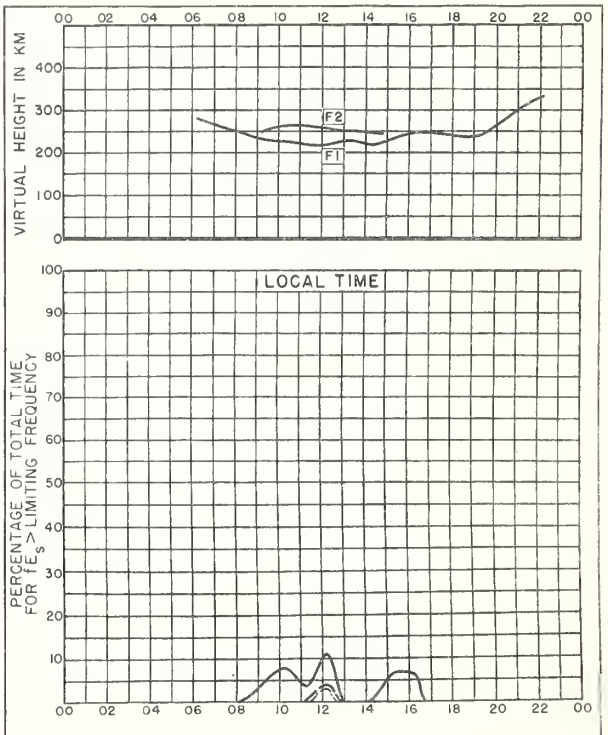

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